

DEALS
FOR
READERS

COMMODORE USER

Incorporating Vic Computing

Volume 1 Issue 9 June 1984 UK price 85p

THE APPROVED PRODUCTS SCHEME

64 CLOCK

PARAMOUNT PROFILED

64 MODEM

AARGH!



ASSEMBLERS FOR THE 64

SCREEN SCENE-GAMES REVIEWS

WEDGES

AARGH!



WORDSWORDS

ad word processing the mid-term roundup

★ Butterfield ★ Tommy ★ Readers programs ★ Free classified ★

Audiogenic Vic-20 Games...



...never turn your back on them.

Spiders of Mars, Outworld and Cloudburst - three classic cartridge games - now available on cassette! Bonzo and Kaktus, both bestsellers, are now joined by the latest crazy mazy game - Shifty! From all major software shops everywhere.

These incredible games cassettes all require 8K minimum RAM expansion. All prices include V.A.T. and P & P.

WRITE OR PHONE FOR FREE COLOUR CATALOGUES

Audiogenic LTD

Bonzo
£7.95

Kaktus
£7.95

Shifty
£5.95

Spiders
of Mars
£5.95

Outworld
£5.95

Cloudburst
£5.95



Audiogenic, PO Box 88, Reading, Berks, England. Tel: (0734) 586334.

NOTE!
OWNERS OF
BBC-B • ORIC • SPECTRUM
DRAGON • QL - the TP1 is compatible!

The BEST VALUE Letter Quality Printer - available for the CBM 64

Now with DATAPLUS Interface & cable to run your WP Software

all for **£299** inc VAT & FREE DELIVERY

READY FOR IMMEDIATE USE
- JUST PLUG IN & GO!

IDEAL FOR:-

- * HOME CORRESPONDENCE
- * BUSINESS USE
- * DOCUMENTS
- * SHORT STORIES

The TP1 manufactured in the USA by Smith Corona, is without doubt the best value for money letter quality printer ever offered to micro users. Dataplus-PSI Ltd. have added the UK's best interface and cable assembly to connect the CBM 64 and TP1 together for running Easy Script and other software packages. Guaranteed to work first time

Use standard stationery or, for only £79 (if ordered with your TP1) we will supply a tractor feed so you can use continuous or fanfold paper.

VISIT OUR SHOWROOM AT 39-49 ROMAN ROAD, CHELTENHAM.

Don't delay - At this price the stocks won't last forever!



Dataplus have made their name supplying computer peripherals at competitive prices. Software that we have found the best price of performance is also what alternative to old habits. The deal pays for both data and word processing. Truly a high quality machine at an affordable price. No Managing Director I guarantee you with 1 day better.

Richard



0242 527412 (24 hr)

SPECIFICATIONS

Print Speed: 120wpm
Character set: 128 ASCII 88 printable
Character spacing: 12 CPH
Printing: Unidirectional
Paper width: 13" max.
Writing line: 10.5" 126 character line
Line spacing: 6 lines per inch
Paper Feed: Friction single sheet or fanfold
240 wpts, 50Hz
Dimensions: 14.6" x 6.4" (W) x 19.5" (D)
12.4"

INTERFACES

Parallel
Centronics compatible 7 bit parallel data, 3 control lines (data, strobe, busy acknowledged)

Serial
RS232C compatible 50-19200 BPS, parity and character bit length all switch selectable

For technical queries telephone our EXPERT HOTLINE 0242 37373 or call in at our showroom.

DATAPLUS-PSI Ltd. 39-49 Roman Road, Cheltenham GL51 8QU

To DATAPLUS-PSI Ltd. 39-49 Roman Road, Cheltenham GL51 8QU
Please send me -

Qty	Description	Price	Total
	TP1 with RS232 interface	£290	
	TP1 with centronics interface	£290	
	SPS-2X (PRINT plus 1X) WORD WP	£299	
	TP1 + CBM 64 interface	£389	
	Tractor feed	£78	
	Derive as applicable		
		Total	

I enclose my cheque for £
payable to DATAPLUS-PSI Ltd or charge my
Access/Bank/Debit Card Account No

£

Expiry date of card

Signature

Name

Address

Postcode

Telephone No

Please allow 28 days delivery

Full money refund if not completely satisfied and returned with original packaging within 10 days, UK ONLY

Make Model of my computer

CUS

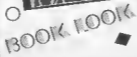
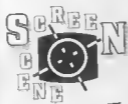
Contents

COMMODORE User

Publisher: Annabel Hunt
Managing Editor: Dennis Jarrett
Editor: Karl Dallas
Features Editor: Bobban Bucak
Special Correspondents: Jim Butterfield, Chris Durham, Jim Grubbs, Tony Harrington, Chris Preston, Mike Todd
Editorial Assistant: Nicky Chapman
Circulation Manager: Hywel David
Subscriptions Manager: Janet Crawford
Production Manager: Paul Hulme
Art: Magnus Underwood
Production Editor: Mike Patenden
Advertising: Roland Richardson
Deals for Readers: Nicky Ned and Vicki Staples

Editorial: 01-241 2448
Advertising: 01-241 2417
Production: 01-241 2493
Administration: 01-241 2354
Subscriptions Back Issues:
 (See last page) 0732 381216

Publisher's guarantee: There are no mistakes in this magazine except this one.



News

What's news to us is probably news to you, and this time we've got our hands on Commodore's brand new modem for the 64 - among other things!



Show time again

The world's premier Commodore-only exhibition runs from 7-9 June in London - and we'll be there in force. The exhibitors will have the latest games, the latest add-ons, the newest business software for all the Commodore computers (there'll be Commodore itself, of course, with its new machines (and some good 64 stuff too) and there'll be advertisers like the racemaster from Radio Luxembourg. As a preview and taster, here's a run-down on the goodies you can see at the Fifth International Commodore Show.

Aaaaargh!!! The errors of your ways



The Vic and 64 are quick to highlight your mistakes by flashing a veritable host of error messages on to the screen - but that doesn't guarantee you finding out where you've gone wrong. Here's a practical guide to what the computer might tell you, in the shape of an alphabetical list of error messages: what they mean - and what you might be able to do about them.



Screen scene for Vic

Happily, new games for the Vic keep on trucking on. Here's a review panel's regular and highly critical look at yet another batch of newcomers.

Vic virtuals

Another batch of program-todder for your Vic.



Butterfield on 64 video - part 6

This time, Jim plunges into more advanced and technical waters: split screens on the 64. Has to be seen to be believed, and makes full use of what he's already taught us in previous issues. Can you find a better intro to the 64's ways with displays? No, you can't.

Machine-code packages for Vic and 64: three head-to-head reviews



When you've mastered Basic, your next stride should inevitably be towards machine-code programming - run faster, use more of the computer's facilities. And to help you there are plenty of ready-to-go packages around to choose from. David Bolton indicates what you should be looking for from such products and assembles three of them for inspection. User-friendly 8862 for Vic Mikro for the 64, and Orinex for both. Which did he prefer?



Word processing round-up

Chris Durham takes a well-earned breather from his Macrauser task of reviewing WIP packages for the 64 - he's done a dozen and there's more to follow. But it is time for a mid-term report on the state of play in professional word processing really feasible on the 64? What should you look for in a word processor - and what will you have to pay? How do the packages he's reviewed already compare with each other?

Deals for Readers returns - bigger and better!

55

The early summer bustle in our mail-order section is now over. And we've been using the time well - more products, more discounts to offer you. Like a decent tape database package at a good price like a very fine assembler/monitor/char package for Vic and 64 like not one but two Commodore User cartridges for the 64, one an excellent set of 1000+ commands and the other with a strong collection of extensions to basic Basic - and there's more!



Screen scene for the 64

After last issue's extension into disk based games, we're back to the latest offerings on tape. Some duds, but also some champions

64 visuals

Among this month's offerings is a program that allows you to draw pictures on the 64's screen in 32 res mode - using a joystick.



All about wedges

Wedges are very useful for keeping doors open, but there's more to them than that. You want to add extra commands to Basic for use in your programs? The Wonderful Wedge lets you do just that. Chris Preston shows you how

Commodore's seal of approval

The Commodore Approved Products Scheme started about five years ago, embracing its 'seal' on selected Commodore-orientated products from independent suppliers. Is it a rip-off? A gimmick? A guarantee of respectability for the suppliers? A safeguard for the users? Bohdan Buziak found out how (and if) the Scheme works - and ponders on whether the accolade represents any real value



The Directory of Commodore User Groups - part one

Whether you're in Wordhapp or East Omsweed, there are users eager to share their computing - and there'll be a club with a Vic and/or 64 box just waiting for you to join. We've been collecting and updating our information on user groups in Britain and abroad - almost everywhere except the USA, in fact. We go Statewide next issue

64 Book Look

A mixed bag of bibliographic offerings this issue, but something for all tastes: yet another attempt to provide a definitive 64 handbook, a book of programs and for the uninitiated, a general introduction to personal computers.



A foste of Paramount

If you're a small software house, newly into the games scene, you've got to make all your products count. Diminutive Paramount Software is making on the Vic and 64, and is looking for a small range of best sellers. Bohdan Buziak took the early train to Stockholm, to find out how Paramount intends to live up to its name

Tommy's Tips

No respite for Tommy: he continues to plough indefatigably through readers' queries. This issue he looks at the Vic's less than friendly R2323 port, the 64's screen display and a 'Monopoly' program



Write Away

Suggestions, complaints, constructive criticism - even praise? You write, we read.



At last — the wired CBM

Commodore's sleek announcement this month is a modem for the 64. That opens the world — literally — to every hacker with enough wit to be able to plug in a cartridge and dial up a sequence of 21 figures.

Karl Dallas has been talking to CBM's Commodore computer in Ohio, USA — and running up enormous phone bills ever since Commodore let him the first of them. Here is his report.

After all the talk in recent years about the wired society Commodore's entry into the new age was almost an anti-climax and a complete contrast to the razzamatazz of their announcements at Hannover in April.

In fact, if you weren't already wired up yourself you would certainly have missed it the only word to come out from Slough was whizzling John Collins' happy announcement to Micronet 800 subscribers (on page 800812298, if you'd like to read it for yourself) that the 64 modem was at last available. He also said that "several" of the modems (I understand the exact figure is about 3,000) were in stock and ready to go to everyone prepared to fork out just under £100 for them, mail order only (in case you think Commodore is getting a touch of the Clive Sinclair, let me reiterate that the modems do exist and are ready to mail right now).

This is a really good news to me especially, because for over a year I've been trying with no success whatsoever and increasing frustration to link up my computer to the rest of the world. In fact I even went to the extent of getting myself a Spectrum because I'd heard the problems had mostly been solved on Uncle Clive's icky-keyboard darling.

For most people wiring up to the world means one thing: joining British Telecom's Prestel network by way of Micronet 800.

Prestel is just a huge mainframe — actually, three mainframes — crammed with all sorts of fax and info that people might want to know from the top of the Charts to the current price of wool futures in Sydney, Australia.

But really it's one of those great ideas that's still waiting to

take off, a solution waiting for a problem to deal with — regarded by people with 'proper' databases as something of a toy fascinating to play with, maybe, but (unless you happen to be one of the travel agents who seem to find it very useful to check things like flying times and the latest cheap tours) of no practical use.

When it first came on: Prestel was touted around by the TV rental firms, and you had to communicate with it by a numeric keypad — which was fine for yes/no choices, but didn't offer much chance of real interactive communication. Then one or two companies started making black boxes which allowed a micro to talk back to the big brother mainframes, and at the 1983 Which Computer Show there came the break-through of Micronet, a cheap and

cheerful way of connecting up micros to Prestel and even down loading telesoftware (often free) on to them. Among the machines able to do it were the BBC, the Spectrum and (I was assured) the Pet. "Including an 8086?" I asked, and was told yes, but there wouldn't be much business telesoftware available for a while.

I won't bore you with the long months of fiddling around inside various Pets trying to connect up UART boards to the J3, J4 and J10 pins on their CPUs, the modems supplied and special sockets fitted for me by the GPO (including a special old-fashioned handset, since I found the acoustic coupler supplied by Micronet didn't fit the new-style receivers being advertised so actively by BT).

Eventually, as I've said I gave

up and got a Spectrum, which worked first time — but only a week later I spotted the news about the 64 modem, which makes everything before it like relics from the stone age.

It's a rather bulky black box that plugs into the cart port with a long lead and one of those new-fangled square jackplugs BT are fitting wherever they get the chance.

With the modem supplied by Micronet's affiliate Prism for the Spectrum, you have to dial up the computer (either 686 6011 or 619 in London) on the phone, then when you hear the high-pitched carrier signal you flick the 'on/off' line switch down, return the receiver, and with about a 50/50 chance of success — you're on.

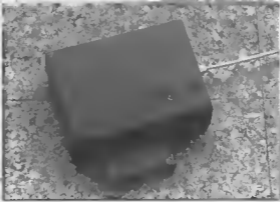
You have to type in a ten-figure customer identifier followed by a four-figure password (to stop people running up bills on your account) and you can start finding out things you thought you never wanted to know and were probably right.

The 64 modem does all the dialing for you. But while users of old-fashioned TV-plus-keyed set-ups can program their equipment to take care of the identification codes, there appears to be no way of doing this with the 64 modem. I have no problem remembering my nine-digit VAT registration number, so I suppose one extra number shouldn't tax my memory very much. In the meanwhile, I've written it on a sticky label on the modem.

A bigger problem, if you have to confine your hacking to popular times like Saturday afternoon, is that if the computer is tied up the modem disconnects automatically after a short wait. Surely it could have remembered the number and kept redialling until it got through?

K-tel disks

K-tel has joined the increasing band of software houses now making cassette games available on disk. That means you'll now be able to buy three of its games for the Commodore 64: *Citytrack*, *Oddyssey* and *It's Only Rock 'n' Roll* — on disk, for £9.95. Will you be able to resist the floppy onslaught for much longer?



Discover these new games for VIC-20...

These six new games written in 100 per cent machine code, set high standards of playability and really make the most of everything the Vic has to offer. Games of action and strategy, great graphics, glorious colour and full sound effects. Try Submarine Commander, Tower of Evil or Mine Madness and you'll want to try all six.

You should be able to find these games from Creative Sparks at your usual software supplier but you can also order them directly from us, completing the form below.

CREATIVE SPARKS

Patterson House, Chertsey, Surrey KT16 9AP

Please complete the coupon and send it with your remittance to Creative Sparks.
Patterson House, Chertsey, Surrey KT16 9AP.
Allow 28 days for delivery. Offer applies to U.K. only.

<input type="checkbox"/> Tank Commander TNCA101	£5.95	<input type="checkbox"/> Mine Madness TNDA30	£9.95
<input type="checkbox"/> Submarine Commander TNCA71	£5.95	<input type="checkbox"/> Mutant Herd TNDA40	£9.95
<input type="checkbox"/> Tower of Evil TNCA91	£5.95	<input type="checkbox"/> Computer War TNCA21	£5.95



All action game with strong strategic element. Penetrate the enemy defences and blow up the ammunition and fuel dumps.

- This great game features:
- Superb sound and graphics.
 - Smooth action scrolling screen.
 - Joystick or keyboard operation.
 - One or two player game.

Requires 8K RAM expansion.
Cassette **£5.95**



Attack and destroy all enemy shipping.

That's your brief in this exciting game of strategy. Can you extend the nerve-racking action spread over three screens provided by this amazing game.

Already a big hit in the USA.
Superb scrolling screen in periscope mode.
Nine pre-selectable levels of play.
Keyboard or joystick operation.
Requires 16K RAM expansion.
Cassette **£5.95**



Action rages throughout.

Move from 7D rooms in the maze-like Tower of Evil, inhabited by such evil creatures as the Baphomet and the Warriors of Apocryphos. To defend yourself, you know first-hand from your fingertips on your journey to rescue the princess.

Superb action graphics in this 100% machine code game.
One or two player game.
Joystick or keyboard control.
Requires 8K RAM expansion. Cassette **£5.95**



Gold mining with a very big difference.

Half-crazed monsters and the which eerily move up and down of their own accord have to be faced in this unusual game.

Seven levels of play.
High score feature.
Keyboard or joystick operation.
Runs on unexpanded Vic-20.
Instant plug-in cartridge action at cassette price **£9.95**



Protect the powerhouse from the crazy mutants with the help of your power.

Crossed laser beams. Guide the laser into the mutant burrows to destroy the eggs.
This unusual and exciting game benefits from two screens of all action play.
One or two player game.
Runs on unexpanded Vic-20.
Instant plug-in cartridge action at cassette price **£9.95**



Based on the hit movie "War Games"

Using both strategy and good shooting destroy the incoming missiles and avoid the holocaust.

An amazing game with superb scrolling landscape when tracing missiles.
High tension play when trying to crack the code.

Keyboard or joystick control.
One player game.
Requires 8K RAM expansion. Cassette **£5.95**

Please make your cheque or postal order payable to: TECS

Name _____
Address _____

Signature _____



Method of Payment
Cheque
Postal Order
Access/Barclaycard

CHEQUE



Card Number _____



Software briefing

Commodore's recent Software Briefing may have sounded like a high-powered affair but it wasn't. It merely gave already sap-hardened journalists the chance to try out Commodore's latest soon-to-be-launched software offerings.

That amounted to a whole range of educational and games software (it's getting difficult these days to distinguish between the two) mainly for the 64. A solitary not-plugged-in Vic lurked at the far end of the table. We were assured that new games are being launched for it. So why weren't they being displayed? Well, someone had forgotten to bring the required RAM pack - a lame excuse.

Fishing for games

For arcade action enthusiasts Commodore was displaying a range of five games for the 64. *Mayhem*, *Pandora's Box*, *Punchy*, *Little Icons* and *Humphrey Names* sound familiar? Quite right, they're all from the Mr Micro software house.

Commodore doesn't write its own software; it regularly engages in what Commodore UK's software boss Gail Wellington calls "a cut-the-past operation". Having cut it, she hauled in Mr Micro for two reasons: "they have good software, and they were willing to be marketed. Mr Micro is more interested in creating than marketing software".

With Commodore's mighty marketing muscle behind it, Mr Micro is already working on new material exclusively for Commodore - and probably smiling while he does so.

The five games will cost you £5.99 each on cassette. But disk drive owners can buy the whole set on one disk for just £19.99,

that sounds like good value.

Unlike some disk-based games, these don't make full use of the disk's increased capacity. But many of them look quite good and original. Like *Pandora's Box* for example, which displays a nice 3D effect: you try to stop various nasties leaving the box in *Little Icons* you fly the winged youth through mythical Greece to find his dad; don't fly too near the sun, though. *Punchy* is based on *Punch and Judy* complete with sausages and rotten tomatoes.

And it looks as though the trend for acquiring games from already established software houses will continue. Apart from Mr Micro Commodore is dealing with *Scarcade* to market its *Savage Pond* game for the 64 under the Commodore umbrella and there's a link with *Widget Software* too though no details are to be had yet.

Work and play

Commodore has also acquired some educational games for 8-to-12-year-olds from Applied Systems Knowledge, a London software house specialising in 'fun learning on micros for kids'. The range is available for the 64 only and most of the games come on cassette at £5.99 each.

On cassette there's *Let's Count* four counting programs for tiny tots, *Hide and Seek* a visual memory game (two cassettes for £9.99), *Face Maker* lets you make a multitude of ugly/funny faces, and *Words, Words, Words* use words to build up a picture from a range of ten scenes (two cassettes for £9.99).

Least but not least is *Number Painter* a Mancie Miner-type maths game with pretty impressive graphics. That's being produced in cartridge form costing £9.99. And Gail Wellington's pretty pleased about it. It's got the playability necessary for education games.

In the picture

Commodore's also got something for the more creative-minded. Both the drawing packages we mentioned briefly in the April issue of *Commodore User* were on display.

Rolf Harris Picture Builder (cassette only £5.99) is a low resolution package. You use joystick or keyboard to select and draw with any of the characters and graphic shapes the 64 can produce. More advanced is *Tony Harris Art Master* (cassette £5.99, disk £9.99) which gives you a high-resolution drawing facility also using a joystick or keyboard.

Finally, to the Vic. That gets a program called *Music Writer* (cassette, £5.99) allows you to compose a tune and play it back in various different forms. The Vic also gets a range of arcade-type games on cassette for £4.99 each, and there's a four-pack of unexpanded games too for £9.99.

Speaking out

So what's Commodore got under development? Well, it's introducing more software to run with its Magic Voice speech synthesiser for the 64. The latest project is the *Talking Books* series: titles include *Mancie Garden* and *Magic Toolbox*.

Each package contains five stories for children to read and write. Sections of text are illustrated on the screen and 'read' by the voice module. There's a dictionary too, so children can get an explanation of any words they don't understand - no prices or availability dates yet, though.

You need Magic Voice to make the *Talking Books* work but the module is optional for the RJ the *Beu* series of basic reading and writing programs. These are being developed by the Educational Psychology department at Birmingham University - real educationalists. Again, no real product or prices yet.

So it looks as though Commodore's commitment to software is continuing according to plan - not just to games but to more practical and useful software. Moreover, it's not just announcing availability but showing us the real stuff - unusual for Commodore.

Robotic chores

BP Oil organised its first *Buddarobot Competition* last year. That generated such a lot of entries - over 1,000 of them, especially from schools - that it's running the contest again.

But this year the sophistication level is going up.

Last year, BP asked you to build a robot that would retrieve a cube. This time you're set the more ambitious task of constructing either 'a lifestyle robot to perform a useful domestic task' or go for the set challenge of building 'a mobile robot to serve a drink to each of two people seated in a room' (mine's a double).

No need to hurry, though, the National Finals aren't until October 1985. But you must be aged under 19 on 31 August of that year to be eligible. Prizes? Those haven't been fixed yet but the total hand-out will be more than £5,000.

Last year, winners got £500 each with lesser sums for runners-up (and that figure should increase this year). Of course, money isn't everything; you could get yourself on the telly (last year's winning robot chased *Selena Scott* round the TV AM studio - no extra prize for that).

According to Brendan Lomax, BP's PR man, "all sorts of computers were used but quite a few entries were based on the Commodore 64". He emphasises that the competition is really designed for schools; so if you haven't received BP's information pack, it can acquire one from Mrs Francis Parker at BP Oil Ltd, BP House, Victoria Street, London, SW1E 5NQ.

Subscription problem?

We do not keep our subscription records on the premises, so if you have a query, calling us only adds time and doesn't solve the problem.

Please send a description of the problem to: **AKT Subscription Services**, Downgate Works, Douglas Road, Tonbridge, Kent TN11 2TS.

Superbase 64

SPECIAL FREE DISK OFFER IN THIS ISSUE

Take the screen test and be a STAR!

in the *LiveWire* high score competition*

Use your skill and dexterity to win one of our fabulous prizes.

Free entry form in every game purchased

*only on Gridtrap 64 and Jumpin' Jack 64.

- PRIZES**
- 1st Commodore 1541 SINGLE DISK DRIVE
 - 2nd Commodore 1520 PRINTER PLOTTER
 - 3rd Commodore SIMONS BASIC CARTRIDGE
- Seven winners up will receive the latest Pro Ace joystick as prizes.

WATCH OUT FOR TRIAD 64 COMPETITION COMING SOON

more fabulous prizes to be won

GRIDTRAP 64

We promise you won't be able to turn it off! It's a real skill tester and loads of fun to play!

Play with the Keyboard or Joystick. Choose your own operating keys with our **User Definable System**. Compete with an opponent by selecting **Two Player Mode**... Great graphics, super sound effects in the *LiveWire* tradition including a selectable Melody Mode where the tune is available at the touch of a key and Melody On is indicated by a quaver graphic.

Program No. LW04 £8.95



JUMPIN JACK 64

Not just a game... an Experience!
IT HAS IT ALL... EXCITEMENT... HUMOUR... & STRATEGY

Jumpin' Jack leaps into a totally new look for the 64 created by **Three Dimensional Graphics** giving **Full Perspective** to the game. PLUS... hosts of features never seen before!

Submerging Turtles - Snakes - Crocodiles - Otters - Lady Frog - Dragonfly!!!

It's Fun... it's **FROGGRIFIC**...

Program No. LW02 £8.95



TRIAD 64



NEVER BEFORE HAS A COMPUTER GAME LOOKED SO EXCITING... FELT AND PLAYED SO EXCITING...

Watch outwitted as the Triad hunt themselves towards your craft in a remorseless battle against your intrusion.

Feel the heat blast of their anti-matter fields. Your pulse laser will have to burn white hot before the encounter is over.

Featuring
A new DIMENSION...
into the realm of **TOTAL PERSPECTIVE GRAPHICS...**

Program No. LW03 £8.95

Clip the coupon and return to: Sunblock Microware Dept. GU
198 Deansgate, Manchester M3 3NE
or Telephone: 061-634 4233

Please send me the following Software:

I enclose Cheque/P.O. for £ _____ inc. P + P.U.K. only

To Name _____

Address _____

Post Code _____



Also available from good computer dealers and bookshops nationwide

LiveWire Software

198 Deansgate, Manchester M3 3NE

Telephone: 061-634 4233

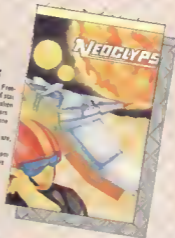
TRADE ENQUIRIES WELCOME

ARCADE ACTION & ADVENTURE WITH... COMMODORE 64



Moby Dick

The object of this game is to blow up submarines, destroy the helicopter and catch the falling pilot, but do not hit the whale.
£7.95



Neoclips

You are the GOOD GUY. Frantic Fighter and renowned sniper. The BAD GUYS, so when they launch their systems have invaded NEOCLIPS, one of your colonial planets. Being the good guy that you are, you set off to liberate the Common Folk of Neoclips from the aggression of the Bad Guys. The Bad Guys have populated Neoclips with several radar towers which reveal your position to them.
£7.95



Cosmic Split

You are caught in a vicious jungle of giant insects. Centipedes are attacking you from all sides. Killer flies are dropping from the sky, and to top things off there's a venomous spider lurking in the back ground.
£7.95



Metroblitz

The object of this game is to defend your city against an onslaught of suicidal aliens.
£7.95



Kystals of Zong

Your object is to overcome one over obstacles and overpower creatures without an overpowering you as you progress on your quest for the Kystals of Zong. Quick reactions will be necessary if you are to succeed along with guide you.
£7.95

**the finest arcade
action and adventure
from the U.S.A. Canada
and the U.K.**



PSS SOFTWARE

FOR INSTANT CREDIT CARD SALES TEL (0203) 667556. SEND CHEQUE OR P.O. TO PSS 452 STONEY STANTON RD. COVENTRY CV6 5DG. TRADE ENQUIRIES CONTACT JOHN FLETCHER, COVENTRY (0203) 813446

WE PLEAD NOT GUILTY

Dear Voice of the Industry

COMPUTER GAMES PIRACY

This letter is being sent to all specialist microcomputer magazines and concerns the cancer that is eating the very heart of our industry.

Computer games software is the dynamic success story of the current economic recession and is an area where, for a change, Britain has a tangible lead over competing countries. The games software industry is part of the emerging leisure technology industry and our lead in games will be reflected in other areas of technology as they emerge, given a chance.

The boom in games software has created jobs, not only directly but in printing, duplicating, advertising and in the magazine industry. As leisure technology progresses it could become a major source of employment.

All this is being jeopardized by the selfish activities of members of the public who are copying games instead of buying them, thus theft. We are not talking about isolated instances, we are talking about "user groups" running mini-production lines at their evening meetings and sending as many as 2000 copies of successful individual titles at one go. Conservative estimates regard seven copies for each legitimate product as being a realistic overall picture of the marketplace.

This is risking the livelihoods of everyone in the industry, including the magazines. The games companies have far less to spend on advertising space and if the epidemic continues will have less still. This is the reality of the situation.

The media is a powerful force yet in this instance is doing little or nothing to use this power. Some magazines even carry small advertisements for blatant copies, some magazines have actually earned editorial condoning the thieves. They are cutting off their nose to spite their face.

The time has come for all computer magazines to follow a concerted campaign to stop piracy. Editorial must campaign for law changes creating harsher penalties. The copying clubs must be exposed. Advertising executives must filter out the piracy adverts. Piracy must become unpopular.

It is no good expecting the software companies to solve the problem, they have not the organisation or power - it is the



media that has. Any magazine that does not act is not facing up to reality.

David Henry Lawson, chairman, Mark Lawrence Butler, managing director, Ian Betherington, financial director, Bruce Everiss, operations director, Imagine Software Ltd, Imagine House, 5 Sir Thomas Street, Liverpool, Merseyside L1 5BW.

In your assessment of the software market you will have noted the general concern over the levels of illicit copying of programs is believed to have reached.

The Guild of Software Houses is active in seeking measures to restrict this threat.

In this respect magazines can assist by adopting a responsible attitude in the acceptance of advertisements which may be considered against the best interests of the industry.

The commercial success of any publication is, of course, the criterion and revenue from this source is a fundamental consideration as is the continuation of creative products which provide a significant information base for journalists and their medium.

The displays generating most consternation appear to be concentrated in the classified section.

It is now time for the press to be seen to act in a creditable manner and support this campaign to eradicate piracy.

Response on this matter will be measured in the form of a survey conducted by G.O.S.H. during 1984.

Yours faithfully

Rod Cousins, Vice Chairman,
Guild of Software Houses.

COMMODORE USER SAYS:

*So software piracy is
the fault of the micro
media, is it?*

Of course, if illegal copying on the scale alleged by Imagine's letter is going on - and we await the prosecutions of those "user groups" (their quotes) who have employed assembly-line techniques to duplicate as many as 2000 copies of successful titles in breach of copyright law - is it to be condemned? And we condemn it, as regular readers will know.

On the other hand, the industry's obsessive concern with "protection" puts the honest user wishing to create security back-up copies, or a suite of much-used programs on a single disk, into the dock alongside the true pirate. That often diverts energies which might be better devoted to improving the basic product and ensuring a viable after-sales service to users, particularly of business and utilities software.

Thus letter ignores the motivations of most of those who resort to "piracy". Rarely is it the sort of big business that has bedeviled the video trade. It's more like the situation in the music business, where people resort to copying albums on to tape because it's one way of ensuring a reasonable-quality version of the best music on offer rather than the click-and-hiss compilations of occasional highlights surrounded by track after track of mediocrity that is the average contemporary pop LP.

Similarly, there is so much duff computer software about - stuff that won't LOAD or RUN, and stuff

that's boring or doesn't deliver what is promised on the box. It is hard to condemn those who want to share their discoveries with their micro-mates.

Nevertheless, if the Imagine directors want to condemn piracy, then OK: computer piracy is wrong, immoral, and ought to be illegal, if it isn't already (we need a test case to prove whether the copyright laws actually apply).

We are also against *sin* (some *sins*, anyway): but we don't think pious declarations will abolish it.

And we are always against manufacturers distributing software that has been inadequately debugged, duplicated without the necessary quality-control to eliminate the non-RUNners and presented in covers whose art bears scant relation to the image on the screen when it's finally persuaded to perform.

As a magazine, we like to think we're doing our part to weed out the duff programs. We do refuse ads that we know are for copying devices and programs, though these are readily available elsewhere, and anyway we doubt that they are the real cause of the trouble.

We are also opposed to so called "cures" like the tape lavage and similar walnut-crushing steam-bathings being proposed in some circles. These are generally worse than the ills they are supposed to handle, and they extend Government interference into areas of life and recreation where the snooper and the money-grabbing bureaucrat have no business intruding.

We don't think anyone owes us or the software companies a living. And we regard their advertising with us, not as charity from a grateful industry but as a hard-headed, commercial acknowledgement of the editorial policy which made us the best-selling user-specific micro mag within a month of our going on to the bookshelves.

PIRATES were high on the robbery list, taking an average annual profit of £100,000. They were not really any threat that posed a threat to the music business. Piracy is as old as sea-churches. The great Roman, Julius Caesar, was once captured by pirates. The most dreaded pirate of the Middle Ages were the Barbary pirates, with their headquarters in Algiers and neighbouring ports. They were Muslims, and did not capture Christian slaves, whom they did not share. The riches of the Spanish West Indies attracted pirates of all creeds. They lay in wait off the Portuguese and Spanish coasts and often snatched a prize from under the nose of the armed galleons. During the 18th century, pirates



Late for Valhalla?

Legend's Valhalla was launched last October on the Spectrum, it's grabbed £2 million in sales since then and has won two games awards. But it's only now available on the Commodore 64 at a beefy £14.95.

That's seven months after its initial launch and a sackful of assorted computer games have grown old and mouldy since then. Why has the conversion taken so long? And is Valhalla on the 64 a legendary dead duck? "The 64 poses a lot of technical problems," explains John Peel, Legend's proprietor. "Converting Valhalla to the 64 was more difficult than actually writing it for the Spectrum. But that conversion is a dramatic improvement on the original. Everything happens more quickly, making the game more challenging."

Peel has no doubts that, despite Valhalla's comparative longevity, it will sell on the 64. "We expect it to reach the top of the Commodore charts immediately on release," we're already got over £250,000 of advance orders. Valhalla is unique, it's not an adventure game but an interactive computer movie." We'll be reviewing it soon - popcorn in hand.



Cut-price games

The computer games software industry has already publicly aired its feelings about illegal tape copying, gloomily predicting the industry's demise if the pirates aren't stopped.

But more intimations of disaster follow this time from Derek Meakin, head of National Micro Centres (sounds very official, but it's a retail shop chain).

According to him, the industry may soon be "cutting its own throat", thanks to the cut-price operation of Mastertronic, a new games software company.

Mastertronic has what is called "a revolutionary pricing policy", that means you'll pay just £1.99 for a game-tape - three for the price of one, as it were.

Is Mastertronic trying to prove something? "Mastertronic will endeavour to prove what the market has long believed that software currently available is generally overpriced." So asserts Martin Alper, one of Mastertronic's directors.

Over to Meakin: "This might sound fine for the computer user. But many of the software houses are working on very tight margins already, and a price-cutting war could well bankrupt the more vulnerable one."

Then there's the question of remuneration for software writers: if the royalties are low, "this means that quality and standards - will slide rapidly".

Of course Mastertronic doesn't see it that way; it's offering those small software-writing concerns the chance to sell in large volumes, with Mastertronic using its distribution and marketing skills to sell to supermarket chains, garages, newsagents, to fit

dealers and the like - places you wouldn't expect to find games. The intention is to encourage what it calls "impulse buying". But you'll also find the Mastertronic range in places like Boots, W.H. Smith and the retailers supplied by the big distribution chain Websters.

Mastertronic took a stand at the recent Home Computer Show in Manchester and reportedly generated a great deal of interest - albeit with few sales. People weren't sure what to make of its bargain-basement games, it seems. But that was a few weeks ago. Martin Alper now reports that in its first three weeks Mastertronic sold 165,000 games nationally and that one dealer clocked up sales of 400 in two weeks - somewhat quicker than selling hot cakes.

More than twenty "top quality games" titles are already available, of which eleven are for the 64 and four for the Vic. And Mastertronic is aiming for 80 titles by the Autumn, with plans for educational and business software. We've got a bunch for review and will be reporting soon.

Obviously the games sell because they're cheap but Alper doesn't see them as a substitute to top-quality and more expensive games, there's a strong place for those too. "The industry will settle down into a two-tier system. Our games don't take long to develop and will appeal to a lower age group." And their bottom threshold won't be very high - so you buy another one. Looks as though the age of disposable games has well and truly arrived.

Plug

According to B&R Electrical Products, a lot of sensitive electronic equipment is at risk from sudden spikes or surges on the mains: office computers and word processors, electronic typewriters, home computers, videos, cash registers, hi-fi equipment, instruments and controllers, and so on.

Mains-borne interference like that can be generated by switches, fluorescent lights, motorised equipment, air conditioning, vacuum cleaners, washing machines, printers. These everyday surges can be in excess of 3000V, thunderstorms can easily generate over 10,000V on the mains.

You won't then be too amazed to learn that "for such sensitive and valuable equipment B&R recommends fitting its new PowerCleaner surge suppressor plug". This just replaces an existing 13 Amp mains plug, yet it can provide a dramatic reduction of up to 80% in equipment damage or disruption.

Most modern electronic gear is designed to withstand surges to 600 or 700V. Anything greater than this can actually cause permanent damage, though a one-time loss of data or program is more likely. The PowerCleaner plug effectively limits surges to 625V, a level at which B&R says "tests show a 99 per cent reduction in equipment damage from spurious surges".

Priced not unreasonably at £8.65 plus VAT, PowerCleaner is available from B&R stockists (further info on 0279 3456).

SHORTS

Botton up: Standard Commodore joysticks don't have a pushbutton on top of the stick, which happens to be an obvious and very handy place for a fire button because you can hit it with your thumb. But for £2.95, Computer Supplies will send you a Top Fire Botton Kit with which you can quite easily add your own. We've tried it, the button itself is a bit small but it works, and it does improve the joystick. If you don't fancy putting it in yourself, send your joystick with £4.45 to Computer Supplies at 146 Church Road, Boston, Lincs PE21 0PX, Barne Hill at Computer Supplies also told us he can handle just about any repair to joysticks.

Now the Commodore 64 means business

The Game's over. Wouldn't you like to increase the applications potential of your Commodore 64? Transform it from a fun family computer into a truly professional tool? Now — Thanks to Handic, the world's largest creator of Commodore software — you can give a powerful new dimension to your 64's performance. We have pioneered a new program called **CALC RESULT** that dramatically expands the financial planning potential of your Commodore.

Doctors, Dentists, Lawyers, Bankers, Brokers and other money managers exploit it to keep track of complex client accounts. Builders, Garage Owners, Retailers of all sizes, and

descriptions now use the spread sheet formula for instant feedback and analysis of trading results. In a world where ease of access and speed of assessment are essential, **CALC RESULT** gives everyone the power to harness the untapped potential of their Commodore.

CALC RESULT is versatile... use it to calculate loan and mortgage payments, forecast budgets, balance cash flow, monitor stocks and shares, plan personal and corporate taxation, check expenses, log and analyse all kinds of bills.

CALC RESULT instantly translates figures into multi-coloured bar charts. It has a built-in 'HELP' function and is absolutely accident proof.



Calc Result

offers you a new perspective on financial planning. Our 3 dimensional spreadsheet sums up pages of figures in one easily understood financial model.

£99.00 (inc. VAT)



Calc Result Advanced

All functions in **Calc Result** Easy plus 32 pages (Three dimensional viewing). Page add, window, split screen (up to four pages on the screen at the same time), and help functions.

Delivered on plug-in cartridge plus disk. Requires disk drive.

For more information contact our Advisory Centre on 0344-778800 or simply contact your local Commodore or Lightning dealer, or clip the coupon.

£49.95 (inc. VAT)

Calc Result Easy

Single page spreadsheet (64 columns x 254 rows). Built-in graphics. Formula protection, flexible print out, colour conditional functions and mathematical functions. Delivered on plug-in cartridge. Data storage on cassette or disk.



I would like you to send by return post further information on the

Handic 64 range

Name

Title

Company

Address

Tel

5 Albert Road, Crowthorne
Berkshire RG11 7LT
Tel: 0344-778800 Telex: 845426

handic
software Ltd

Thinking ahead

All the Best

BASIC Adventures in Space

£9.95

BOOK & TAPE
COURSE



An exciting course for all children from 7 to 77. Learn BASIC while enjoying this most exciting space adventure. Master the computer to escape from the Alien Planet!

The course contains four computer-aided learning programs to teach the major BASIC commands. Available for the CBM 64, VIC 20 (and BBC, Electron and Spectrum!)

**Beginners BASIC course for the
CBM 64**

£10.50

BOOK & TAPE
COURSE

A complete beginner's course for the CBM 64. It assumes no prior knowledge of BASIC and teaches by means of projects. The enclosed software contains a character generator, sprite generator, synthesiser and all six games developed in the text. **Included is also Honey. Aid 1 which adds 28 NEW commands to CBM 64 BASIC.**

Courses are also available for BBC, ORIC, ELECTRON, APPLE, DRAGON, SPECTRUM, LYNX

Courses for the CBM 64 and VIC-20

**Beginners Assembly Language
for the CBM 64 or VIC 20**

£12.50

BOOK & TAPE
COURSE



A complete beginner's course contains a full two-pass assembler featuring:

- Labels
- Memory labels
- Macros
- LOAD/SAVE
- Hardcopy
- Insert/Delete

Also Binary/BCD/Hexadecimal tutor to explain the maths used in machine-code programming. Covers whole 6502/6510 instruction set

**HONEY
FOLD**

HONEYFOLD SOFTWARE LTD

Standfast House
Bath Place
High Street Barnet
London EN5 1ED
Tel 01-441-4130



Courses are available from: W H Smiths, BOOTS, SPECTRUM stores and all good computer shops and many bookshops

gho

Four new machines, and that's official!

Excitement among the estimated 40,000 keen punters expected to attend the Fifth International Commodore Show at the Novotel, Hammersmith, London from June 7 to 9 will become even greater with the now official news that the company will be showing no fewer than four out of the six new machines premiered in Hanover in April. (see last issue) and that these are all definitely planned for release within the next six months.

The new ones are (in rising order of price)

- **Commodore 16**, a 16K machine due for September release at about £90 (all prices including VAT), possibly also in a £130 'starter pack' with cassette deck and software. Described by Commodore as 'a very advanced home computer with features normally found on computers costing much more designed with first-time users in mind' in many ways the 16 could be considered as a 16K version of the 64. It has a slightly more sophisticated keyboard than its big brother, with four arrow-shaped cursor keys and a help key. Thus, they say, will be 'a great asset when learning to program' since 'it highlights errors in lines of programming right down to individual instructions and tells you why they went wrong'.

The 16 has Basic 3.5, which has over 75 commands 'including built-in graphics and sound commands' as well as the usual toolkit functions often purchased separately, a built-in machine language monitor and a screen windowing capability.

- **Commodore's Plus 4** originally known as the 264), also due in September at a probable price of £250 or so. At first sight, the main difference between the 16 and the 264 seems to be the 60K of user-available memory available in the latter machine to host the total ROM and RAM in the Plus 4 totals 96K. It will now come with 'Three Plus Ones' (hence presumably, the Plus 4 name): integral software, resident in ROM, consisting of a word processor, spreadsheet records management (more of a mailing list program, rather than a fully-fledged database), plus a sophisticated business graphics program. 'Three Plus Ones' was originally one of the features of the 264 but there are now



no place to release this machine in Britain.

- **The 5296**, an addition at the top of the 8000 business range, is actually being delivered now at a price of £914.25. It is similar to the 8096 except with 24K system memory in ROM and 128K user RAM. It is upwards compatible with the rest of the business range meaning that 8032 and 8096 software will generally run without modification, but some exciting other languages will also be available including UCSD Pascal.

- A further addition may come with the much talked about Commodore PC, based on the

IBM compatible Hyperion.

Details concerning its impending launch were unavailable at time of going to press.

- **ST5 481 disk drive**, with a maximum data transfer rate of 1675 bytes per second, allowing an average access time of 293 milliseconds.
- **DPS 1101 daisywheel printer** using a 100-character Triumph-Adler compatible typewheel, bi-directional printing at 18 cps, switch selectable between GEM ASCII and standard ASCII, switch or software-selectable 10/12/15 or proportional pitch, offering underlining, bold and shadow print, horizontal and vertical tab, subscript and

superscript.

- **MCS 801 dot-matrix colour printer** allowing seven-colour dump of high-res screen and letter printing at 38 cps with an 8 x 8 matrix.
- **1703 high-quality colour monitor**, suitable for use with a computer or VCR, and having a front-mounted composite video socket and rear-mounted sockets for luminance and chrominance and audio signals, in keeping with the current trend towards component video.
- **1531 cassette unit**, similar to the familiar C2N cassette drive, but with a DIN plug for the 16 and Plus 4 and a recording light.

In addition to the Commodore displays of hardware and software and the individual exhibits, the features of the exhibition itself will attract enormous interest, with the involvement of Radio Luxembourg on a daily basis, daily seminars organised by ICPUK, featuring lectures on the new PC, the shortly-to-be-launched Computek service for owners of the CBM 84 modem, legal protection of software and disk access as well as a problems 'surgery' (see panel for full schedule).

There will also be international football and basketball challenges, learning soccer and basketball stars playing the highly acclaimed cartridge games, TV 'leaps and plans' presenter Patrick Moore introducing his astronomy program, 8J the Bear star of the new talking educational software, appearing in person. A business simulation using the famed Corplan software and illustrations of entries for the international computer art challenge, in a setting allowing would-be electronic artists to have hands-on experience of programming graphics are other attractions.

Users outside London will have a second chance to see the goodies on display at the Northern show in Leeds from September 27 to 29.

Hago®

Personal Computer Workstation.

At last you can get it all together.

Whether you're operating from home, school or office, the Hago PCW (Ref 812) adds the professional touch to your computer layout. Handsome, sturdy, with a place for everything, the Hago PCW is the home every personal computer deserves.

• **Optional programme copyholder** (Ref 815).

• **VDU Worktop** with paper rack takes all VDU's and TV's up to 14" size. Adjustable to keep VDU correctly related to the keyboard. Worktop size 24 1/4" x 13 3/4"

• **Keyboard Worktop** Adjusts from 20 1/4" to 29 1/4" high.

• **Optional shelf** for doc drives, tape recorder printer etc. (Ref 813)
• **Optional undershelf** with paper rack (Ref 814)

• **Sturdy stable frame** finished in Chocolate Brown with simulated Teak work tops. Mounted on castors for complete mobility

• **Overall size**
31 1/4" d x 36 3/4" h x 22 1/4" w



The Office



The Home



The School

Hago®

Hago Products Limited, Shripney Road,
Bognor Regis, West Sussex.
Telephone: 0243 863131 Telex 86421

Please send me full details of the Hago PCW.
Name _____
Address _____

show

ON WITH THE SHOW

ACCOUNTING (BUSINESS)

Anagram Systems	D19
Electronic Aids	
(Tewkesbury) Ltd	A2
Handic Software Ltd	D13
JCL Software Ltd	C27
Micro-Simplex Ltd	
AS1/AS2/AS3	
Pegasus Business Software	
F61	
Quick-Count Ltd	A68
Saxon Computing	
Supersoft	A43

Accounting packages for the small-to-medium size business increase in their power and sophistication, for instance Anagram Systems' INTEGRATED ACCOUNTING SYSTEM, v IV and STOCKMASTER, both available for both the 8000 and 700 series, both of them fully integrated single-disk programs.

Such software is also becoming available for the less powerful machines, for instance Electronic Aids' range of programs for the 64, added to their already well-known series for the 4000 and 8000 machines, such as PAYROLL and INTEGRATED ACCOUNTS, including purchase ledger, with aged creditors, sales ledger with invoicing to the user's own design, statements, daybooks, VAT analysis, stock control, automatic posting to nominal ledger with manual override, nominal journals trial balance, complete audit trail, management reports, profit-and-loss, and balance sheet.

SUPERCLERK, a complete word processing/accounting/filing and payroll program for the small business, and HOTEL SYSTEM, including guest booking, stock control, guest records, word processing, and filing, will be shown by JCL Software.

The name of Simplex, associated with some of the most

popular accounting stationery, is a hallmark of the Micro-Simplex off the shelf accounting system designed to run on the 8000 series, with entries following a similar format to that used in the familiar Simplex D book.

Another powerful package comes from Pegasus, actually a suite of seven programs, available individually or as an integrated system, consisting of invoicing with sales order processing, stock control, purchase ledger, sales ledger, nominal ledger, payroll, and job costing.

A CASH TRADER'S BOOK KEEPING SYSTEM for the 64 can be rented for as little as £3 a week, complete with hardware, from Quick-Count Ltd, who will also be launching a LEASEHOLD PROPERTIES RECEIVABLES program which is believed to be the only one of its kind (£149 80).

ACCOUNTING (HOME)

Adamsoft	A111
Anagram Systems	D19
Handic Software Ltd	D13

The power of home machines like the 64 brings many of the electronic business tools to a much wider market, for instance CASH BOOK 84 from Anagram which has extensive nominal ledger and can produce profit and loss reports - very valuable for the self-employed or part time businessman or club treasurer.

Other useful home programs include CHECKBOOK MANAGER and BUDGETTEER from Adamsoft.

BUSINESS PROGRAMS AT THE SHOW

Anagram Systems	D19
-----------------	-----

ICPUG SEMINARS AT THE COMMODORE SHOW

Thursday June 7 16.00

Computnet and Networking

Brian Grainger

Thursday June 7 17.00

The IBM PC and how it relates to CBM

Simon Tranter

Friday June 8 16.00

Legal Aspects of Software

A. Kohnan

Friday June 8 17.00

Disk Storage

Mike Todd

Saturday June 9 16.00

Adventure Games

F Gerrard

Saturday June 9 17.00

Problem Child

Simon Tranter

APS Microsystems	B37
Dataview Wordcraft Ltd	B35
Handic Software Ltd	D13
Implex Designs (UK) Ltd	A65
Micro-Simplex Ltd	

AS1/AS2/AS3	
Pegasus Business Software	
F61	

Precision Software	
H69/A146	

Quick-Count Ltd	A68
Saxon Computing	A1

Supersoft	A43
Tamsyn	B31

Viza Software	A135/A136
---------------	-----------

Commodore business users who have so far been limited to the 96K memory of the 8086 with its rather complex memory banking, will be pleased to learn of the new generation of business machines on the horizon, the 128K 6296, the 256K Z8000 with Unix availability, and of course, the redesigned Hyperion, to be known as the Commodore PC, presumably to emphasise its IBM compatibility (see report from Hannover, last month).

All of these are expected to be on show, if only in prototype form.

But 64 users will be excited to know that they won't be left out of the bigger memory stakes. RAM Electronics are hoping to have a prototype of their new 256K expansion cartridge for the 64 at the show, and they're talking of a 512K expansion ready next year at about the time the first CBM PCs should become available.

More CPU memory, of course, also implies more memory required for data storage, and two "third party" companies will be offering hard disk and multi-megabyte cartridge options.

APS Microsystems' ALPHA 10 is a removable mass-storage cartridge for the 8000 and 700 series business machines, available in 10, 20, 30 and 40 megabyte versions with 30MB of

Go hunting with **CAESAR THE CAT**

MIRRORESOFT

SOFTWARE FOR ALL THE FAMILY



**SEE US AT THE
COMMODORE
SHOW**

on-line storage, fast backup and minute off-line capacity, a 1.13 Mbs data transfer rate and a typical access time of 10 msec, allowing 10 Mbs of data to be copied in under ten minutes.

Also available is the BETA 5 with 5+3 Mbs of tape and the low-cost GAMMA 5 Mb Winchester at around £1500.

Small Systems Engineering will be offering up to 92 Mbs of storage in a new high-speed single and multi-user hard disk system, allowing up to 64 users to share a single drive.

Capacities available are eight, 10, 20, 40, 65 and 92 Mbs, and all models have integral on-line tape backup, built-in error-correction code and dynamic display of drive status, CBM DOS enhancements, including multi-user file locking and passwords, and a complete range of utilities.

With local area networking becoming a current buzzword, there'll be a lot of interest in Dataview's HYDRA local area network, allowing CBM 64s to act as low cost collectors of data, with an 8000 acting as overall controller.

Terminal and communications software have been added to the programs offered by Impex Designs with their VIDEO PAX 80 80-column cartridge for the 64, along with word processing and an 1100-cell spreadsheet.

Of major interest to business users will be the powerful CORPLAN business simulation game running on the 64 or the main Commodore stand. Previously available only for the 8032 and 8096 business Pets, the game has been specially rewritten for the Show, employing sophisticated graphics.

Basically, Corplan allows players to assume the roles of production director, sales director, finance director, and managing director/chaorman of a company manufacturing Corplins (whatever they may be). They have to manage resources, plan advertising budgets and sales campaign, (including keeping the right numbers of reps on the road), maintain stocks, and ensure profitability - which determines how the company's shares do on the stock market.

STIRLING RETURNS TO LE MANS

Veteran racing driver Stirling Moss will return to the Le Mans circuit, in spirit at least, when he takes on all comers in the popular game at the Games Arcade at the Commodore Show.

He will also be introducing his son, Elliott, to computer cartoon character B.J. the Bear in the new range of speaking "Magic Voice" software.

Another visiting celebrity will be Chris Biggins, from ITV's "Surprise Surprise" and he'll have some surprises for visitors up his sleeve.



More properly described as information retrieval systems, databases are now attracting the attention of the small user, with their facility for storing, extracting and manipulating all kinds of data, from mailing lists to records and video catalogues.

Perhaps the biggest news here is from Precision, who will be first off the mark with software for the forthcoming 16-bit Commodore PC, a rewritten version of their already popular SUPERBASE, increasing the maximum record size from 1108 to 1 Kb in length, and the total number of screen formats in a database up to 99, 240 columns wide. Also included is a comprehensive text editor and extended Basic interpreter.

SUPEROFFICE consists of an integrated program including SUPERBASE and SUPERScript II, running on the 8096, a truly superb package at a professional price (£795.25).

Meanwhile, a number of £15 applications packages have been produced to run under SUPERBASE 64, including some for the home (birthdays, diet plans, domestic accounts), and for business Superbase has sold over 10,000 copies in the 64

variant, and is now selling at the rate of 3000 a month.

The cartridge-based MAGPIE from AUDIOGENIC, £99.95 is a very powerful program, entirely menu-driven, with maximum record size 3050 characters with 53 fields - 26 alpha and 26 numeric - plus calculator screen, menu-driven "procedure" (program) editing, and help screens on disk.

The more advanced programmers, interested in developing specialised database applications, will find virtually every facility needed in the Calcio MASTER program, a suite of file creation modules, on a disk alongside disk utilities giving the 64 the equivalent of Basic 4. A version is also available for the 8000 and 700 series.

JCL Software have a 4K business ROM for the 8096 whose enhancements to Basic include keyboard input, screen editing, and file read/write functions.

For the less ambitious, EASY FAX £86 from Commodore has a maximum record size of 806 characters over two screens, maximum field-size 40

characters, three levels of password protection, ascending/descending sort, and links with Easy Script.

SPREADSHEETS

Dataview Wordcraft Ltd B35
Saxon Computing A1
Supersoft A43
Viza Software A135/A136

Surely everyone must have a spreadsheet by now and is probably spending so much time checking out the "what if" option that the business is fast collapsing around their ears, but still the new ones come.

Supersoft are promoting us the latest version of the program that started it all, VISICALC3, while Viza's VIZASTAR is at last (it says here) up and running - though that's really a bit of a database hybrid with business graphics thrown in.

Supersoft will also be showing BUSICALC for the Pet and Vic and BUSICALC 2 and the 3D (linked sheets) BUSICALC 3, both for the 64.

Dataview will show their INSTA CALCGRAPH integrated spreadsheet and business graphics programs, also available separately.

Although it could be described as either a spreadsheet, a database, or even a business graphics generator, FIGARO from Saxon Computing is actually a bit of all three, allowing data to be maintained and displayed in a wide range of graphic styles.

WORD PROCESSING

Dataview Wordcraft Ltd B35
Handic Software Ltd D13
Impex Designs (UK) Ltd A65
JCL Software Ltd C27
Precision H56/A146
Supersoft A43

The two big word-processing stores at the show will be Handic's launch of Word RESULT, the powerful companion to Calc Result designed for the 700, with split screen window to access word processing and spreadsheet concurrently, and - at the other end of the market - the modestly-priced disk version of WORDCRAFT 64 from the originators of the program in its various manifestations Dataview (not to be confused with the cartridge-based Wordcraft 40 distributed by AudioLogic).

DATABASES

Precision B69/A146
Supersoft A43
Viza Software A135/A136

Consider our s professional

If you ever have to bring work home from the office you can now tackle it in a fraction of the time, thanks to our range of software.

With these inexpensive new programs you can turn a Commodore 64 personal computer into a fully-fledged business tool to improve the smooth operation of your calculations, filing and ordering or information storage.

All the programs are easy to learn and use, and all cost less than £50.

There's no more cost effective way to turn your home computer to practical use.

Practicalc 64. The complete spreadsheet for Commodore 64.

With this program your cashflow will do just that.

Flow.

Practicalc 64 accepts both numerical and alphabetical entries and allows you to work out sales forecasts, long-term budgets, sales models or long term cash plans.

All in a fraction of the time they normally take.

Practicalc 64 has 2000 cells, more than 20 mathematical functions, (including logarithms and roots), can insert or delete rows or columns, can 'SORT' information alpha-numerically and has a 'SEEK' function to search for specific information.

It can even display the information in graph form to allow a quick visual appraisal of the situation. Disc £44.50 (Tape £59.95).

Over 20 mathematical functions.
Column width up to 38 characters
2000 cells.
Graph function.



Practifile 64. The database for Commodore 64.

Practifile means an end to bulky and time-consuming storage of files, client or patient information or names and addresses.

And it means you'll no longer have to spend minutes or hours searching through piles of paper for a specific piece of information.

Each file on the program is able to handle 3,800 record entries, and Practifile can sort the files it contains by number or letter in less than a second.

The system is so flexible that you can add, subtract, multiply or divide within individual files, while its use with a word-processing system means that you

Sorts files by number or letter in less than one second. Fully compatible with Practicalc 64



Software from a point of view.



can have instant 'hard-copies' in a matter of minutes.

While Practifile means instant access to mailing lists.

At just £44.50 you won't find a more versatile, flexible and professionally useful data-base.

Inventory 64. The quick, reliable inventory system.

With its capacity of 650 items, Inventory 64 is ideal for the average small business, and means a vast improvement in the efficiency of good stock control.

All you have to do is to enter each item, followed by the information which the program will prompt.

That means things like part number, description,

Handles up to
650 parts.
The quick answer
to stock control
problems.



location, stock, year-to-date sales, re-order date, minimum quantity, vendor, list price and other important facts.

From this information your personal computer, with the help of Inventory 64, will be able to collate and assess the major points of an efficient system and be able to present you with a complete and instantaneous view of current stock situations.

And ensure that stock control problems really are a thing of the past.

Pretty good value at just £29.95.

You'll find our superb range of Commodore 64 software for professional and business use in all good computer stores including selected branches of Boots, W.H. Smith, Menzies and Laskys.

If you'd like more information about our software or require any technical help fill in the coupon or phone us on 0475 462721.



Name

Address

CU 6/84

 **PRACTICORP**

Guckland Road, Whitehouse Industrial Estate, Ipswich IP1 5NP UK 0475 462721

How to get there

Hammersmith is in West London, of course, which makes the place pretty convenient from just about all directions except East Angles and North East London. Driving there isn't too bad; the public transport services are excellent.

By car

Getting to the Canard International Hotel can appear daunting and is the subject of numerous apocryphal stories about beggar drivers circulating feverishly around the Broadway looking for a way to it. But in reality it's not too difficult.

The main hotel entrance is in Shortlands and there's a two-way road connecting Talgarth Road and Hammersmith Road.

Coming from Earls Court and Central London you aim for the A4 and follow signs to Heathrow. Rental etc until you reach the Hammersmith flyover, otherwise

the next possible exit is a couple of miles further on. So get into the left-hand lane and take the side road signposted.

'Hammersmith'; and at the next opportunity, turn right and make a U turn under the flyover. That puts you briefly on Talgarth Road going the other way, Shortlands is the first left.

Coming from Kensington and the West End, drive through High Street Ken and past Olympia. You're then on Hammersmith Road without trying. Shortlands is the last turning on the left before you reach the ugly kingsize roundabout at Hammersmith Broadway.

Coming from the West you snick with the A4 until you're offered the Hammersmith and Shepherd's Bush exit just before the flyover. Again, don't miss it: it's tricky to find your way back again! You follow the slip road on the Broadway, go right round the roundabout past the tube stations, and don't aim for Kensington: it might look the obvious route from the map, but there's no right turn into Shortlands from that direction. Instead take

the next exit signposted 'Central London'. This puts you on to Talgarth Road and Shortlands is the first left.

Coming from Shepherd's Bush and the North you aim for the Broadway, avoid the temptation of the Kensington direction, and follow the Central London sign again with Shortlands the first left.

Car parking is in theory available at the Hotel itself: there's an NCP car park under it but most of the space is likely to be taken by exhibitors and the Hotel's regular guests.

There are two other decent sized car parks locally: one is off Queen Caroline Street (get on to the Broadway and take the exit after the Odeon), the other is behind the new shopping precinct called Kings Mall (take the King Street exit from the Broadway and follow the signs around to it: it's about five minutes' walk from the hotel).

Alternatively you might just be lucky and find a space in some side-street. Your best bet is probably in the maze of streets just North of Hammersmith Road.

By tube

This is the obvious way to come if you live near a Piccadilly, District or Metropolitan Line station. On the Piccadilly and District Lines you look for the 'Broadway' exit from Hammersmith station, turn right past the Clarendon pub and search for the subway that gets you under the Broadway itself.

The Metropolitan Line exit is on the North side of the Broadway so turn left and brave the traffic at the foot of Shepherd's Bush Road and try for the island of office buildings which also contains the Canard.

Hammersmith is served by dozens of buses, too.

Leaving by cab

If you need a taxi, you'll probably find some at the hotel or will be able to flag one on the Broadway. But there is also a cab rack on the corner of Shortlands and Hammersmith Road, and there's another at the junction of the Broadway and Hammersmith Grove.



RICHARD SHEPHERD SOFTWARE

A HOME BUDGETING & BANKING SYSTEM THAT REALLY MAKES YOUR COMMODORE 64 WORK!

NOW ON CBM 64 DISK AND CASSETTE



A professional style multi function Cash Controller program. In disk format you can load, and make an entry... or update your existing records... In just seconds. This easy to use program can handle up to 400 transactions, giving instant statements of your bank balance. Now there's no excuses for going into 'the red' and paying unnecessary bank charges!

BANK ACCOUNT

- Statements on demand from any date to date
- Holds up to 400 transactions.
- Standing order facility
- All transactions can be automatically coded to allocate up to 16 budget headings
- Search facility for any single item by description or amount.

HOME BUDGETING

- 16 budget headings, e.g. Gas, Rates, Car, Tax - you can choose the headings
- Highlights under/over spending
- Full budget expenditure breakdown
- Budget "re-think" facility

LOAN/MORTGAGE CALCULATOR

All you ever wanted to know but didn't like to ask! Calculates

- Interest rates
- Payback periods
- Capital sum
- Period of loan

- PRINTOUT FACILITY
- FULL SECURITY WITH PERSONAL PASSWORD
- SAVE DATA ONTO CASSETTE OR DISK

Available from good computer stores or direct by mail order at a price that won't upset the Bank Manager!

CASSETTE
£9.95
INCP & P

DISK
£14.95

Compatible only with 1541 Disk Drive

INCP & P
Dealer enquiries
welcome.
Generous discounts.



PRIORITY MAIL ORDER

Please send me _____ CASH CONTROLLERS
all £9.95 each 64 Cassette ☐ Please tick
at £14.95 each 64 Disk ☐ Version required
including post & packing (overseas orders add £1.50)
Name _____

Address _____

I enclose cash/cheque/P.O. payable to Richard
Shepherd Software

Or debit my Access/VISA Card Number

Signature _____
ALSO AVAILABLE ON CASSETTE FOR 48K SPECTRUM

All programs are sold subject to the condition that they may not be used or traded or otherwise be lent, hired out, copied or otherwise circulated without the written permission of Richard Shepherd Software Ltd

24 Hour Credit Card Hotline (06286) 63531

REMEMBER TO STATE IF YOU
REQUIRE CASSETTE OR DISK

RICHARD SHEPHERD SOFTWARE

ELM HOUSE, 23-25 ELMSHOT LANE, CIPPENHAM, SLOUGH, BERKS. TEL. (06286) 63531

OOPS!

When the Vic or 64 hits a problem, it puts a message on to the screen preceded by a question mark and followed by 'READY' with the cursor blinking on the line below.

Here's an alphabetical list of the error messages you might get, complete with possible explanations and what you can do about it. Where a line number is involved, that's given here as [n]: it indicates at which line in your program the error was detected, but note that this doesn't necessarily mean the error itself is actually in that line - it may have been caused by something else in the program.

Several of these messages are really obscure and definitely unlikely, some refer only to disk usage, and several involve concepts and commands that are outside the scope of an introductory look like this. But they're all here for the sake of completeness.

BAD DATA ERROR IN LINE [n]

The program was expecting numeric data and got a character string. Correct the data command(s), normally a READ or INPUT statement followed by a numeric rather than a string variable (one with a \$ sign on it).

BAD SUBSCRIPT ERROR IN LINE [n]

You're trying to reference an element in an array that's outside the dimensions you set up with a DIM statement. You'll have to correct the DIM so that the array is larger, or change the array element number so that it's within the range.

BREAK IN LINE [n]

Not exactly an error message - just an indication that the program has been stopped and what line it had reached. This is usually because you wanted it to stop (you inserted a STOP statement in it to see how it was doing so far, or you hit RUN-STOP to halt it) or because you accidentally learnt on the RUN/STOP key.

CAN'T CONTINUE ERROR IN LINE [n]

You've used a CONTINUE command, but the program has been deleted or perhaps amended such that program execution cannot proceed.

The most likely cause, however, is that the computer has previously picked up another error and you haven't corrected it - it won't let you CONTINUE until that has been fixed. Your best option is probably to try restarting with RUN and see if that throws up an uncorrected error.

DEVICE NOT PRESENT

Probably means the device you're trying to get at (usually printer or disk - occasionally cassette) isn't connected to the computer or the mains. That's easily remedied, of course.

Sometimes though you'll get this message for no apparent reason - on my own set-up it sometimes appears when I'm trying to read a file from disk while the printer happens to be switched on. The solution that usually works is to switch off everything you can and try again, alternatively OPEN a channel to the device you want to address and then re-attempt it.

This message can also occur if the devices are powered up in the wrong order - especially if using two single 1541 drives. Experiment to overcome the problem.

DIVISION BY ZERO ERROR IN LINE [n]

The computer won't allow you to divide by zero. You might have tried to do

this by mistyping something, but it's more likely to occur within a FOR-NEXT loop or as a result of filling an array with numbers that you then use in a division. The easiest solution is to put in a check for zero on any procedure that might just produce one in a division.

EXTRA IGNORED

Someone typed too much in response to an INPUT prompt. You may also have inadvertently included a comma in your input. (The commas are used to separate fields and must not be used as an input character.)

FILE ALREADY EXISTS

The computer won't let you set up two files on disk with the same name but it won't tell you that - unless you're trying the COPY command, in which case you'll get this message. Give up and rename the file.

FILE NOT FOUND

You're trying to LOAD or VERIFY a file that the computer can't see on the tape or disk. It's probably not there, but you may have mistyped the file name or misread the number what you called it.



FILE NOT OPEN

You haven't used an OPEN command when the computer wants one from you - which is before a CMD, CLOSE, INPUT or \$ OPEN a file and retry.

FILE OPEN

You used an OPEN command on a file that's already open. Either you don't need to re-OPEN it, or you need a different logical file number in the OPEN command. If in doubt, CLOSE the file and OPEN it again.

FORMULA TOO COMPLEX ERROR IN LINE [n]

You've asked the computer to do too much - you used an expression that has too many brackets or too many functions. Split up the expression somehow that's a good policy anyhow, since it will make life easier for anyone (like you, who has to read through and understand the program in the future).

ILLEGAL DIRECT

Most of the computer's commands can be used in immediate mode (ie the are executed as soon as you hit RETURN) or in program mode (they are executed only when the program is RUN). But these are not valid in immediate mode.

DATA
DEF FN
GET
GET #
INPUT
INPUT #

If you really want to use these, you'll have to write a short program that incorporates what you want to do and RUN it.

ILLEGAL QUANTITY ERROR IN LINE [n]

You have a variable that is outside the computer's range. It usually happens when you're trying to POKE a value less than 0 or above 255. So don't.

LOAD ERROR IN LINE [n]

Something is wrong with an attempted LOAD from cassette - typically the file you're trying to LOAD has been scrambled somehow. You didn't leave the tape on top of the TV, did you?

Error messages and what they mean

There's not much you can do about this, except try again, and if it persists, put it down to experience - and take more backup copies in future.

NEXT WITHOUT FOR ERROR IN LINE (n)

The computer has found a NEXT statement in your program that is not associated with a preceding FOR. You might have missed out the FOR all together, or a NEXT somewhere else in the program might have been tied to your FOR - that can happen if you aren't specific about which FOR variable you want executed NEXT. Check that your FORs and NEXTs pair off.

NOT INPUT FILE

You've OPENed a tape file for output only and you're now trying to read from it. Check your READ# command, but the fault is more likely to be in an OPEN if the third parameter of the OPEN statement isn't 'W' or omitted altogether, you have opened a write-only file.

NOT OUTPUT FILE

A tape file has been OPENed for input only and you're now trying to write to it. Again, check your READ# command, but as above the fault is more likely to be an OPEN - if the third parameter of the OPEN statement isn't 'I' or if you have opened a read-only file.

OUT OF DATA ERROR IN LINE (n)

The computer has run out of DATA items to READ - there must be enough entries in your DATA lines to fill all the variables in READ statements. The simplest solution is to start counting and make sure there is sufficient DATA.

You might also get the problem if you want to read the same DATA more than once - repeat it in different FOR locations or different arrays, say. Then you need a RESTORE before attempting each READ.

OUT OF MEMORY ERROR

You may have run out of memory because your program is too big and/or it's creating too many new values for variables. Buy more memory, simplify the program, or stop it producing so many new values for the computer to store.

You might also get this error even when PRINT FRE(0) shows you have a lot of memory left. In this case what's probably happening is that the stack is filling up with too many nested GOSUBS or FOR - NEXT loops (the stack is an aide memoire for the computer that indicates where in the program it has to jump to and when). The solution? Simplify the program.



This can also occur when loading a program from tape. If the tape header is corrupt then it can overwrite part of the Operating System area and cause a spurious error message. Always turn off the computer before attempting are-load if this occurs!

OVERFLOW ERROR IN LINE (n)

You have a calculation that's produced a number too big for the computer (the largest number the Vic or 64 can handle is $1.70141894 \times 10^{38}$, or $1.70141894\text{E}+38$ as it's sometimes written, either way it's the number multiplied by 10 followed by 38 zeros). You will have to alter the program to avoid this, perhaps by changing the order in which your calculations are done. Do you really need numbers that big?

REDIM'D ARRAY ERROR IN LINE (n)

The same array name has been used in more than one DIM statement, or you are trying to DIM an array name to which you've already allocated a particular number of elements. This is likely to be the result of carelessness, for instance have you got a DIM statement within a FOR - NEXT loop?

It helps to keep all your DIMs at the start of the program, that way they're much easier to check.



REDO FROM START

Sounds awful but isn't. It just means the wrong kind of response has been given to an INPUT prompt - the program was expecting numeric and some-one typed alphabetic, or vice versa. The message will continue to appear until the computer gets the right input.

RETURN WITHOUT GOSUB

The computer has found a RETURN that isn't linked to a preceding GOSUB - perhaps because you missed out the GOSUB or inadvertently added a RETURN (in which case you can add or delete as appropriate), but more likely because the sequence of execution caused the program to fall into a subroutine. In this case, correct the program flow: a STOP inserted before the subroutine might help you find out why it's happening.

An END there should prevent the program running on into the subroutine, a GOTO could skip past it.

STRING TOO LONG ERROR IN LINE (n)

You have too many characters in a string, the maximum allowed is 255. This may have happened because you tried to add too strings together, if there's any danger of a concatenation producing an over-long string, it's worth inserting a rest for length via the LEN\$ function.

SYNTAX ERROR

You have used an illegal term or construction. The probable cause is mis-typing - common culprits are bad spelling, accidentally hitting one character twice while typing, and too many or too few brackets. Check your program lines. And get into the habit of using keyword abbreviations - fewer keystrokes to get wrong.

TYPE MISMATCH ERROR IN LINE (n)

Your program has tried to put the wrong type of value into a variable - string characters into a numeric variable or vice versa. Change the error command.

UNDEF'D FUNCTION ERROR IN LINE (n)

The program is trying to use a function that you haven't defined by a DEF FN statement. Define your function (and it helps to put all your DEF FNs at the start of your program).

Sometimes this error happens because you weren't actually attempting to reference a user-defined function, you've just mistyped something that the computer has detected as a function.

UNDEF'D STATEMENT ERROR IN LINE (n)

You tried to RUN or GOTO or GOSUB a line number that doesn't exist. The target line has been omitted or you got the number wrong.

VERIFY ERROR

The program you're verifying doesn't match what's in memory. There are many possible reasons for this, the best option is to SAVE it again and have another go at VERIFYing. If you are still getting a VERIFY ERROR on cassette, move the tape unit (it might be too near a magnetic field like that generated by the TV set) and/or try a different cassette.

Business Programs

£300

It might sound too good to be true. But it's a fact.

You may have a micro knocking around at home, perhaps for the kids to play games on, keep your wife's recipes on, and maybe you've got your Birthday Card list on too!

But if you run a small-to-medium sized business, you may have thought that it would cost a small fortune to get 'proper programs' to help you run it. You may even think your micro was little more than an educational toy. Well, here's some really good news for you.

Software For All have complete suites of business programs available now to run on one of the most popular small micros; the Commodore 64.

And they cost—not £300 like so many do—but just £30 each, on disk. If you already load programs by cassette, then they are also available in that format for just £20 each.

At such low cost, you might think they're too cheap to be much good, and probably don't work too well either! Well, they *do* work and we *guarantee* them to work. You'll be delighted with them, as thousands are already.

Go along to your local Commodore dealer and ask to see a demonstration of any of them. See for yourself whether they'll do all the routine chores of your office paperwork and how much time and money they will save you and your staff.

Then you'll be convinced that it's true that they're good!

SEE US AT THE SHOW—STAND A67
5TH INT. COMMODORE COMPUTER SHOW

PROGRAM	COMMODORE	DISK	CASSETTE
INVOICING	✓	£30	£20
STOCK CONTROL	✓	£30	£20
SALES LEDGER	✓	£30	£20
PURCHASE LEDGER	✓	£30	£20

Prices are exclusive of VAT

Software For All Business Programs are widely available at all reputable Commodore Dealers throughout the country. But if you have any difficulty obtaining them, please contact us direct and we'll be pleased to advise you.

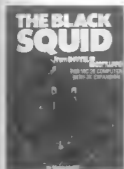
**SOFTWARE
FOR ALL**
BUSINESS PROGRAMS

72 North Street, Romford RM1 1DA

Telephone 0708 60725 Dealer enquiries welcome.

Our regular round-up of games reviews

We get to see a lot of games here at Commodore User, so many in fact that we can't handle all the reviewing ourselves - we farm out some of them, which is why our reviews have someone's initials at the end of them. We look at everything we get, but we don't necessarily print all the reviews we write: instead, we tend to stick with (a) all the best games we come across and (b) those games that you're most likely to find in the shops or the mail order ads.



THE BLACK SQUID
Vic 20 (3K)
Joystick only
Price £6.95

Your shipwrecked men have to brave the unknown waters to escape the dangers of the deep.

You have to get five men to the island in the shortest possible time which isn't so easy, for in the sea are hidden rocks which cut you to shreds if you touch them (there is a way round this if you press the Commodore and shift key you can see the rocks). And there is the dreaded Black Squid which relentlessly comes after you with the single intent to devour your head or feet first. When you reach higher stages you also meet up with the giant clams.

Black Squid is a very boring and difficult game to play. Trying to out swim the squid is near impossible because your man moves so slowly, especially when changing direction. The graphics are reasonable but the sound is poor - a bloop-bloop noise for the chasing squid but your players make no noise at all.

On the whole a poor program

BJ

Channel 8

Presentation:	■■■	□
Skill level:	■	□
Interest:	■	□
Value for money:	■	□



CENTPEDE
Vic 20 (Unexpanded)
Joystick only
Price £19.95

This like Defender is an original Atari game now rewritten for the Vic 20.

In Centipede you are in a forest of mushrooms and you have to destroy the centipede before it can reach you, it's not as easy as that may seem.

The centipede zig-zags down the screen toward you bouncing off the mushrooms. You have a bug-blaster (just happens to look like an upside down mushroom) that is able to move up, down, left and right. Shooting mushrooms gives you a clearer shot at the centipede, but each segment of the centipede that gets hit turns into a mushroom - which sometimes results in the unlikely change in direction of the rest of the centipede, so be careful when it's just above you.

There are other dangers in the forest - spiders which bounce around the screen eating mushrooms and your bug blaster, the scorpion which scurries across the screen poisoning the mushrooms (and when the centipede touches a poison mushroom it goes insane and makes a frenzied dash for the bottom of the screen) and the bee. Not as spectacular as the other two but he just drifts to the bottom of the

screen leaving a trail of mushrooms behind him. To destroy it you must shoot him more than once or he can destroy your bug blaster. All round, centipede is a good one or two player game with well-defined graphics and good clear sound. Atari's cartridge based software for the Vic is a good idea and I am sure it will take off. BJ

AtariSoft

Presentation:	■■■	□
Skill level:	■■■■	□
Interest:	■■■■	□
Value for money:	■■■	□

CHOPPER
Vic 20 (Unexpanded)
Joystick or Keyboard
Price £5.50

Ghopper must be one of the worst games I have ever come across. The spectacular cassette insert is very misleading, with such colourful art you might expect the game to look something like it.

The so-called hi-res graphics are basic, with black figures representing a guided missile launcher, vans, trucks, tanks and the chopper. The only colour is in the ground surface and the underground missile base from where you are being constantly fired at.

As the chopper pilot you have to bomb the passing vehicle while

avoiding the enemy barrage (from the undestroyable underground base) and the guided missile (which is near impossible to outfly because it flies as fast as you and your direction change is too slow).

The game is not enjoyable at all because you can not move and fire at the same time. Poor sound, too. BJ

Stanlock Software

Presentation:	■■	□
Skill level:	■■■	□
Interest:	■■■	□
Value for money:	■■	□



DEFENDER
Vic 20 (Unexpanded)
Joystick only
Price £19.95

This the original Atari Defender, is a zap-zap game in which you are armed with three fighter ships and three smart bombs. Your task is to prevent the alien landers from taking your humanoids. But it's not all that simple, because the landers do not come alone - they have an assortment of fiendish alien buddies such as Pods, Bombers and Baiters. The most lethal of these are the Pods: once one has been destroyed it releases Swarms which ruthlessly track you through space with the single-minded intention of destroying you.

The Baiters only appear after a certain time. These saucer-type

RE-WRITE AMERICAN HISTORY...



There's still plenty of fight left in The Confederate South as each side selects forces to manoeuvre on a full-graphics battlefield. Play against the computer or challenge a friend to perfect your tactics and re-write American History.

WARMASTER CASSETTE

RE-WRITE A PROGRAM...



At last, educational arcade action! Fight off the software bugs and help Micromouse de-bug his programs. Datakill available. Fight through the levels to the highest score

ACTIONMASTER CASSETTE

WRITE TO LOTHLORIEN



CHOC A BLOC CHARLIE

AVAILABLE AT SELECTED OUTLETS OF JOHN MONIZES, M.S., CO. OF SPECTRUM, MAKING, TIGER TRADERS, LIGHTNING DEALERS & WRITER RECORD SHOPS. SELECTED TITLES AT WH/SM/TH. OR YOU CAN ORDER DIRECT BY POST FOR JUST £6.95 (inc. p&h)

Please send me my **FREE** Colour Catalogue ☐
Please send me ☐ Johnny Reb ☐ Micromouse
I enclose a cheque/PO for £_____ made payable to **HC Lothlorien**.
Please debit my Access A/C No. _____

Signed _____

Name _____

Address _____

LOTHLORIEN

More action for your money

POST TO: HC Lothlorien, Sea Park Lane, Poynton, Salford, Cheshire SK12 1RE



craft follow directly behind you moving at a blinding speed and constantly firing; you'll need some good manoeuvring to destroy those ships. But you should always take care in dashing through space in case you come across a Bomber laying its mines across your path - they are still active once it has been destroyed.

Defender is a fast-moving and enjoyable one or two-player game. Well-defined graphics and good-quality sound make full use of the Vic's limited memory, and it's on cartridge too.

The main hitch with Defender is that it sometimes puts you on to the next screen arbitrarily, but who really minds extra points and more lives? **BJ**

Atarisoft

Presentation: **★★★★**
Skill level: **★★★★**
Interest: **★★★★**
Value for money: **★★★★**



DESTROYER
Vic 20 (Unexpanded)
Keyboard only
Price £5.50

Destroyer is another game from Sumlock, but it should not be tarred with the same brush as Chopper this is a far better game.

You are the skipper of the destroyer HMS Victory. Your mission is to destroy the enemy subs in the area, though you are constantly under attack from mines and enemy aircraft. The Victory is

armed with an endless supply of depth charges and two anti-aircraft guns.

The keyboard controls I lost on this game give good control, especially when it comes to shooting down enemy fighters; the radar scanner tells you the direction they are coming from so you know which direction to shoot at. But watch out for bombs! You should always be on the lookout too for the mines which float from the bottom of the screen and constantly cause you to change direction. Once you have past the sea limit you go on to the next screen and the speed of the game increases and so do the number of mines and bombs.

The graphics are pretty crude, the sound and colours not all the best. But I'm sure that Sumlock could have at least disabled the Commodore and shift key.

Sumlock Software

Presentation: **★★★**
Skill level: **★★★**
Interest: **★★★**
Value for money: **★★★**

HELL GATE
Vic 20 (+4 or 16K)
Joystick only
Price £6.00

Hell Gate is the oddest zap em game I have ever seen, in a long time.

You have become the guardian of the Gate which at some point in time will be rampant with alien droods whose mission is to destroy your home planet earth.

You are equipped with four lasers mounted on each side of the Gate, your task is to blast the droods as they materialise in the gate after they hyper-jump through space. Not an easy task, because there are so many of them, that's why you have four blasters. You also have 'smart' bombs three for every wave. They are activated whenever an alien hits your blasters, once all your phasmas are gone you have three lives left.

Hell Gate has up to 20 levels of play; you can select your own level from 1-8, the rest of them you have to reach with skill. When you reach higher levels you will see 'zap' signs; they change colour and on turning red they release a deadly bolt that destroys anything in its path - including your blasters, so beware.

The Hi Res graphics and sound is very good with some spectacular array of alien forms in various colours I have ever seen. Quite a good game for the zap freak, as you'll

aspect from this marquis
Marasof?

Presentation: **★★★★**
Skill level: **★★★★**
Interest: **★★★★**
Value for money: **★★★★**



JUMPIN JACK
Vic 20 (Unexpanded)
Joystick or keyboard
Price £5.50

Another spinoff of that arcade favourite Frogger. In this Jack has been out for a night on the lily ponds (tiles), it's now daylight and Jack has to get back home for a good day's rest. But the traffic is roaring across the road, and the river currents are flowing strongly, and would easily drown any frog that dared to cross it.

Your job is to guide a wary Jack across to his home in one piece. First you have to get him across a three-lane motorway, then you have to negotiate the hazardous river. But help is at hand: you are aided by these white blobs with six growths (head, tail and legs) which form the turtle. There are also logs which you can hop on to as they float by until you reach home. Once you have seen Jack safely across five times you go on to the next screen and it gets harder: the cars move faster, the logs get shorter, there are fewer turtles to help you.

The graphics are fair, but the sound and movements leave a lot to be desired. The movements of Jack and the other moving parts are very jerky, the sound - well, it plays that silly tune throughout the game which drove me to despair. On the whole a fair game, but nothing to write home about. **BJ**
Sumlock Software

Presentation: **★★★**
Skill level: **★★★**
Interest: **★★★**
Value for money: **★★★**

NOTE INVADERS

Vic 20 (any)
Keyboard
Price £9.25

Note Invaders is an excellent way to learn the notes on the musical staff (the five lines on which music written). It's presented as a game these lines are produced on the screen along with particular notes which must be learned before being zapped out by the menacing 'invaders'.

There are three levels of difficulty and either treble or bass clefs can be chosen. Keyboard operation is simplicity itself, in that keys A to G represent those notes displayed on the screen. As you get faster and more accurate, the staff itself gets shorter: so you really have to know your note names well to get a high score.

Four programs are included on this cassette, at least two of which I found particularly useful in my own attempts to learn musical notes. Note Invaders should appeal to all ages - in fact anyone contemplating learning music or perhaps an instrument. **CB**

Chalksoft

Presentation: **★★★★**
Skill level: **★★★★**
Interest: **★★★★**
Value for money: **★★★★**

THE CATCH

Vic 20 (Unexpanded)
Joystick or keyboard
Price, £3.99

If and when I acquire the necessary expertise, the two simple but neat effects employed on the title screen will be incorporated into my own magnificent programs. But enough of daydreams - what about the game?

Simple in concept but effective in execution, a blob saucer is dropping bombs in a quasi-predictable fashion. By moving your shield in an intelligent manner, the city - which is scuttling beneath you - can be protected.

Subsequent to the interception of a predetermined number of pods, the border changes colour and the pace quickens. The sonics are acceptable but a bit primitive, the yellow screen is at least a change from the usual black/space sky.

Most arcade aficionados with an unexpanded machine could find this a worthwhile bet, espe-



BC BASIC At last the ultimate has arrived - a complete 9k extension in a ROM pack. Over 97 new or modified commands and functions have been added and because they have not been fully tokenised, the speed of operation is not affected. Abbreviations may also be used. The main areas of enhancement are **HI-RES, SPRITES, TEXT GRAPHICS, UDG, SOUND, MACHINE CODE AIDS, STRUCTURED PROGRAMMING, I/O and more.** For full spec call us on 073 57 4335 **£57.50** inc. VAT

See us on PRESTEL + 2473222 or Telco 849462 TELFAC KUMA
COMET KUMA TELECOM GOLD KUM 661

PAINTPIC

The complete colour drawing and painting application using multi colour bit map. This outstanding program features **Pen, Brush and Text Modes; Curved Shapes; Straight Shapes; Pen and Brush Fills; Settable Colour; Horizontal, Vertical, Diagonal, By Dot, Brush Width, Character Moves; Point Moves; Block Moves.** No extra hardware items are needed beyond the basic computer, tape drive and colour TV. Send for full brochure **£19.95** inc. VAT

Kuma Computers Limited
Unit 12, Horseshoe Park,
Horseshoe Road, Pangbourne, Berks RG8 7JW

PHONE NOW (073 57) 4335
or SEND FOR DETAILS

Please tick box <input checked="" type="checkbox"/> for information required, and send coupon to		no reply	post back
Kuma Computers Ltd 12, Horseshoe Park Horseshoe Road, Pangbourne Berks RG8 7JW		<input type="checkbox"/> SHARP A <input type="checkbox"/> SHARP 3541 <input type="checkbox"/> SAGE series system <input type="checkbox"/> APRICOT <input type="checkbox"/> EPSON HX 20 <input type="checkbox"/> EPSON QX 18 <input type="checkbox"/> NEWBRAIN <input type="checkbox"/> SPECTRUM <input type="checkbox"/> ELECTRONIC MAIL <input type="checkbox"/> PRINTERS	<input type="checkbox"/> COMMODORE 64 <input type="checkbox"/> SIRIUS <input type="checkbox"/> SHARP PC 1506 <input type="checkbox"/> SHARP 700
NAME	ADDRESS		
<input type="checkbox"/> PRINT 11000			

Game SCREEN GENE

really if competing against a friend.
Bubble Bus £5

Presentation: ●●●●
Skill level: ●●●●
Interest: ●●●●
Value for money: ●●●●



the catch
A game where you control a boat and have to get the fish out of the water.

From the makers of 'The Catch' and 'The Fish'.

SWORD OF HRAKEL

Vic +3K
Keyboard only
Price £5.99

Another Romik text adventure one for the long winter evenings. I think 'Your village has been depopulated by the curse of the evil Mags, you must find and kill the Mags to lift the curse and return your people. Has save game option. Programmer has sense of humour too, I mean what would you do with an agitated duck? Save your answers for the game' JDC
Romik Software

Presentation: ●●●●
Skill level: ●●●●
Interest: ●●●●
Value for money: ●●●●

XENO II

Vic 20 (+16K)
Joystick only Price £7.95

Anurog has a veritable library of

16K games. This is an early one, an epic in four screens. Screen one, in which you hopefully land on the planet Xeno II, is the most attractive. Your parti-coloured (in common parlance, half and half) red and blue craft has to dodge cyan asteroids (solid ones not sketchy outlines) and delicately alight on the landing pad.

Tip to part two: three waves of homing mines to ward off, with a brief colour display for each success. Space invaders follow: personally the aliens didn't appear menacing enough for my tastes, looking rather 'dumpy'. Having succeeded (after many tries) in reaching the last screen you will be faced with a monumental task: to successfully blow a way through the force field and smash the power source, shots must be directed past blocking guardians whilst avoiding the bombs released by another helpful bunch. You will certainly require practice and a fair measure of skill to triumph in the game.

The sound effects are adequate and the program will certainly give you a good work-out. LS

Anurog Software

Presentation: ●●●●
Skill level: ●●●●
Interest: ●●●●
Value for money: ●●●●

ZORGON'S KINGDOM

Vic-20 (+5K)
Keyboard or Joystick
Price £6.99

Not what I would call a 'graphic adventure', more a Koop-type game where you must get through five arcade-style screens in order to destroy the evil Zargon. Each scenario is different, though and it's quite a challenge overall. The graphics are quite good though though the scenarios are only moderate. More difficult than it seems at first. JDC
Romik Software

Presentation: ●●●●
Skill level: ●●●●
Interest: ●●●●
Value for money: ●●●●

From CDS, the ultimate challenge 'COLOSSUS CHESS 2-0'

Written by Martin Bryant

*the finest chess program ever
written for both the chess
player and the chess master*



Available for the Commodore 64 £9.95



Available direct from CDS Micro Systems Send Cheque or P.O.
To CDS Dept. YC1, 10, Westfield Close, Tickhill, Doncaster
DN11 9LA. Tel: (0302) 744129.

CBM 64, BBC & SPECTRUM USERS START HERE...

DFM DATABASE

EASY-TO-USE **BIG-SYSTEM FEATURES** **PRINTED REPORTS** **MAIL LABELS OPTION**
 AVAILABLE FOR CBM 64 BBC SPECTRUM
 £34.90 DISK OR TAPE / SPECTRUM £14.95 / DFM + LABELS £30.00

NEW
DISK
TAPE

HOME ACCOUNTS

BANK ACCOUNT **20 EXPENSE HEADINGS** **NAME & ADDRESS FILE** **LOAN FORECASTS**
 AVAILABLE FOR CBM 64 BBC SPECTRUM
 £14.95 TAPE / £10.95 DISK

NEW

TRANSACT

BOOK-KEEPING SYSTEM **ALL DAY BOOKS** **JOURNAL** **NOMINAL LEDGER** **VAT**
 AVAILABLE FOR CBM 64 BBC 'B'
 £38.00 DISK OR TAPE

INVOSTAT

INVOICE & STATEMENT GENERATOR **AUTOMATIC CREATION FROM SALES PRODUCT TABLE**
 AVAILABLE FOR CBM 64 BBC 'B'
 £30.00 DISK OR TAPE

NEW
DISK
TAPE

STOCK-AID

STOCK CONTROL SYSTEM **EXTENSIVE ON-SCREEN & PRINTED REPORTS**
 AVAILABLE FOR CBM 64 BBC 'B'
 £32.00 DISK OR TAPE

NEW

ELECTRONICS

STUDY AID WITH COURSE TUTOR TO CITY & GUILDS STANDARD
 AVAILABLE FOR CBM 64
 £14.95 DISK OR TAPE

“dialog...”

ALL PROGRAMS AVAILABLE SOON FOR
SPECTRAVIDEO & ORIC ATMOS
 ENQUIRIES WELCOME

SOFTWARE SUPPORT GIVEN
 ON ALL PRODUCTS

FURTHER INFORMATION PHONE
 01 289 8904 OR 01 501 0799

MAIL ORDER SALES DIRECT FROM
 DIALOG SOFTWARE
 20 NEW ROW LONDON WC2N 4LA

ACCESS & BARCLAYCARD ORDERS
 PHONE CHROMASONIC 01 263 9493

DISTRIBUTED IN UK BY
 BOOKWARE MICRO DEALER PCS
 SOFISHOP WEBSTERS

DISTRIBUTED IN S. AFRICA BY
 DIALOG SOFTWARE SA
 JOHANNESBURG 7265755

DISTRIBUTED IN AUSTRALASIA BY
 IMAGINGERING
 SYDNEY 7121411 FOR CBM 64
 ELLISON HAWKER
 MELBOURNE 5551344 FOR BBC
 MICRO ALLSOFT
 MELBOURNE 2413031 FOR SINCLAIR

 PLEASE SEND ME FURTHER DETAILS
 OF YOUR COMPLETE RANGE OF
 PROGRAMS FOR
 CBM 64 BBC SPECTRUM

NAME
 ADDRESS

TELEPHONE
DIALOG SOFTWARE
 20 NEW ROW LONDON WC2N 4LA 2

Business accounts

Sales Ledger (Anagram) d	75.00
Purchase Ledger (Anagram) d	75.00
Sales Ledger (Ramtop) t	14.50
Purchase Ledger (Ramtop) t	14.50
Cashbook (Microsimplex) d	172.50
Inventory 64 (MMS) d	29.95
Cash Book (Gemini) d,t	69.95
Final Accounts (Gemini) d,t	99.95

Home accounts

Bank Manager (Mr. Chip) t	7.50
Budgeteer 64 (Adamsoft) t	8.95
Checkbook Manager (Adamsoft) d	14.99
Home Office (Audiogenic) t	14.95
Home Accounts (Gemini) d	29.95
Home Accounts (Gemini) t	19.99

Database systems

Diary 64 (Handic) c	29.95
Magpie 64 (Audiogenic) d	99.99
Mailpro 64 (Kobra) d	79.35
Oracle 64 (Kobra) d	113.85
Practifile 64 (MMS) d	44.50
Simply File 64 (Simple) d	80.00
Superbase 64 (Precision) d	99.95
Vizastar 64 (Viza) d	99.95
Printer cable for above	20.70

Spreadsheets

Basicalc (Supersoft) d	47.15
Basicalc (Supersoft) t	44.89
Basicalc 2 (Supersoft) d	81.65
Calresult Adv. (Handic) d	99.00
Easy Calresult (Handic) d	49.95
Multiplan 64 (Kobra) d	99.95
Practicalc 64 (MMS) d	44.50
Practicalc 64 (MMS) t	39.95

Programmers' Aids & Utilities

Arrow (Supersoft) c	44.85
Assembler (Interceptor) t	7.00
Chartpak 64 (Adamsoft) d	24.95
Chip mon (Mr Chip) t	12.50
Forth 64 (Audiogenic) c	29.95
Graphics Designer (Adamsoft) d	19.95
Graphix 64 (Supersoft) t	11.80
Master 64 (Supersoft) d	71.30
Mikro Assembler (Supersoft) d	89.80
Monitor (Audiogenic) c	29.95
Pal 64 (Kobra) d	79.35
Printlink 64 (Supersoft) c	32.20
Quickchart 64 (Adamsoft) t	6.95
Screen Graphics (Adamsoft) d	14.99
Sprite Aid (Adamsoft) t	5.95
Stat 64 (Handic) c	29.99
Superdisk Utility (Adamsoft) d	12.50
Synthy 64 (Adamsoft) d	14.95
Ultrabasic 64 (Adamsoft) d	24.95
Victree 64 (Supersoft) c	56.35
The Tool (Audiogenic) c	49.95
64 Doctor (MMS) d	19.95

Word Processors

Paperclip 64 (Kobra) d	98.90
Simply Write 64 (Simple) d	40.00
Simply Write 64 (Simple) t	35.00
Vizawrite 64 (Viza) d	79.95
Vizawrite 64 (Viza) c	89.95
Vizaspell 64 (Viza) d	99.95

Educational

Mathematica 1 (Commodore) t	9.99
Mathematics 2 (Commodore) t	9.99
Physics (Commodore) t	9.99
Biology (Commodore) t	9.99
Chemistry (Commodore) t	9.99
Geography (Commodore) t	9.99
History (Commodore) t	9.99
English (Commodore) t	9.99
Besieged (Sulis) t	9.95
Just a mot (Sulis) t	9.95
Tina traveller (Sulis) t	9.95
Word power (Sulis) t	9.95

d=disk t=tape c=cartridge

Games

Over 180 different games by

Adamsoft	Llamasoft
Alligata	Melbourne House
Anger Productions	Mr. Chip
Anirog	Mogul
Audiogenic	Peaksoft
Brndgemaster	Postern
Commodore	PSS
DK Tronics	Rabbit
Galactic	Romik
Games Machine	Supersoft
Imagina	Terminal
Interceptor	Voyager
	Virgin
	Visions

ALL IN STOCK NOW

Immediate despatch
Full price list on request

Cheque or P.O. - Credit Cards: Access, Visa
Callers welcome (11am - 6pm)
Tel: 01-242 7158

Commodore 64 Video:

Part 6: Split screens by Jim Butterfield

This time we'll look into a fairly advanced technique: split screens on the Commodore 64. It's a new aspect of the computer, combining things we have already learned into a new set of capabilities.

We'll need to venture into more technical waters here ... but with a little effort, we can perform some minor miracles on the Commodore 64 screen. All the limitations we have learned may be set aside with a little creative 'cheating'. We'll have to venture into machine language; but even if you're not a ML tyro, it's worth knowing that the job can be done.

We have learned a number of limitations, largely based on the idea that the screen can do a lot of things, but only one at a time:

We can have only one background colour, unless we are in multi-colour mode; and even in that case, we are restricted to our choice of colours.

We can obtain information only from one 16K memory quadrant. We can only use one character set.

We can be in character mode or bit map (hi-res) mode, but not both.

We may have only eight sprites on the screen at one time.

In fact, we have a more general set of modes. We may be in only one mode at a time - multi-colour is either on or off, extended colour is either on or off, and so on. It seems impossible to mix screen modes and have the best of both worlds - but we can do it.

Here's the trick: The 'Raster Register' address D012 together with the high bit of D011, can do more than tell us where the screen is being painted at this instant. We may store an 'interrupt' value there and tell the computer 'Advise me when you can get that part of the screen.' And at this point, we can switch screen characteristics: colour mode, high resolution, background colour, character set, memory bank whatever you want. Of course, we need to put it all back when we return to the top of the screen.

The Task

We're going to write a quick program to split the screen into two parts, each with a different characteristic. It won't be perfect, we're just trying to show you the technique and not polish up all the loose ends. The fine points will come later. First, let's plan.

If we set a new 'interrupt' into our machine, we'll need to make some careful distinctions. First: what an interrupt happens, we must establish who caused this one? Was it the raster, or the traditional interrupt source of I/O second timing? And second, if it was a raster, which part of the screen is involved - the top or the 'wack' part?

Let's start to lay out the machine language program. All interrupts will come here, and we'll need to sort them out. We'll put the program into the cassette buffer.

```
033C AD 19 D0 INT LDA $D019
033F 29 01 AND #001
0341 F0 19 BEQ REGULAR
```

The interrupt has happened and come here. Check the Raster Interrupt Bit in D019 - was this one caused by the Raster? We'll need to mask out the bit we want to with an AND. If we get nothing, it's a regular interrupt - go there.

```
0343 ED 19 D0 STA $D019
```

It is indeed a raster interrupt, and we must shut off the alarm. We do this by storing the bit back where it came from (there's a 1 in the A register right now). Amazingly,

this turns the bit off.

```
0346 A2 92 LDY #092
0348 A0 15 LDY #015
```

We'll prepare the registers assuming we are doing the top-of-screen work. The hex 92 is decimal 146 - the scan line that hits about mid-screen; that's where we will want the next interrupt to take place. Note that hex 92 is considered a 'negative' byte, we'll use this fact just a moment.

Now, let's see if we are correct about being at mid-screen.

```
034A AD 12 D0 LDA #0D012
034D 10 04 BPL MID
```

We look at the raster scan. If it's less than 147, we're near the top of the screen, and we don't see the 'negative' byte. So we stop ahead.

If, however, we are at the middle of the screen, we'll see a 'negative' value. We won't branch, instead, we'll fix up the registers for mid-screen work:

```
034F A2 61 LDY #061
0351 A0 17 LDY #017
```

Both streams join again at this point. X contains the raster

location where we will want the next interrupt: if we're at the top, we want to be interrupted at the middle (hex 92); if we're at the middle, we will want to be interrupted at the top (hex 01). Y contains information on the character set we want to choose graphics or text. Let's proceed.

```
0353 6E 12 D0 MID STX $D012
```

Place the next interrupt point into the raster register. The next interrupt will now hit at the right time.

```
0356 8C 19 D0 STY $D019
```

Place the 'character set' value - hex 15 for graphics, hex 17 for text - into the appropriate register.

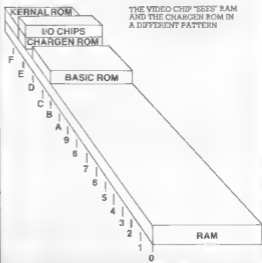
```
0359 4C 0C FE JMP $FEBC
```

We've done our job. We may now exit. Don't give an RTI - instead, go to a routine that clears things up nicely, at FEBC. And what of our regular interrupt?

```
035C 4C 31 EA REGULAR JMP $EA31
```

It goes to the normal address - to which regular interrupts go. We must have more to do after

COMMODORE 64 ARCHITECTURE



we get this program into memory. We must also detour the interrupt vector to our new program, and fire up the raster interrupt control.

Back to Basics

Ready to code all this stuff in Basic? Here we go:

```
60 POKE 53265,27
100 FOR J=628 TO 862:READ X
110 T=T+X:POKE J,X
120 NEXT J
130 IF T<>3856 THEN STOP
200 DATA 173,25,208,41,1,240,
25,141,25,208,162,146,160,21,
173,16
210 DATA 208,16,4,162,1,180,23,
142,18,208,146,33,208,76,188,
254,76,48,234
300 POKE 56333,127
310 POKE 788,60:POKE 789,3
320 POKE 56333,128:POKE
53274,128
```

Let's look at the last three lines. Line 300 kills the interrupt for a moment, so that we can mess with the interrupt vector without running into disaster. Line 310 changes the interrupt vector to point at our newly-poked program. Line 320 restores the interrupt, and adds an extra one the raster interrupt.

Running It

When the program is run, an amazing thing happens: the screen becomes graphic at the top, and text at the bottom. Impossible, you say? Not for us clever (and careful) people. The effect is permanent. You may NEW the program and start something else and the split screen will still be there.

You shouldn't use cassette tape with this program in place - it's there in the buffer. And you may find that LOAD and SAVE don't work quite right. RUN-STOP/RESTORE will put everything back in its former state.

The Unsolved Problem

But it's not perfect (I warned you). Every once in a while, the barrier seems to creep slightly and then correct itself. Maybe it's computer hiccups. It seems worse when you are using the keyboard. What's happening? And how can we fix it? Stay tuned ...

Son of Split Screen

That simple program to split the screen of the Commodore 64 is similar but not identical to this one:

```
90 POKE 53265,27
100 FOR J=628 TO 862:READ X
110 T=T+X:POKE J,X
120 NEXT J
130 IF T<>3826 THEN STOP
200 DATA 173,25,208,41,1,240,
25,141,25,208,162,146,160,6,
173,10
210 DATA 208,16,4,162,1,160,8,
142,18,208,146,33,208,76,188,
254,76,48,234
300 POKE 56333,127
310 POKE 788,60:POKE 789,3
320 POKE 56333,128:POKE
53274,128
```

Our previous example split the screen into two sections: graphics and text. This one splits the screen into two background colour areas. It makes it easier for us to see the glitch that occasionally disturbs our screen split. By the way, it's easier to see the problem when you are using the keyboard.

Why the problem?

Here's where the problem comes from: the timer interrupt sticks about every 1/60 of a second. The screen display runs at a rate of about 50 lines a second in Europe.

The two processes run at similar but not identical speeds. Every once in a while the timer interrupt lags just before the raster interrupt.

The timer interrupt has quite a few jobs to do: update the TIS clock, check the cassette motor, flash the cursor, and check the keyboard. It takes time to do these jobs, and extra time is required if a key is being pressed.

Suppose we have just started on the timer interrupt, and the raster scan says "I'm ready!" Sorry, raster; we're already into an interrupt routine, and other interrupts are locked out until we have finished. By that time, the screen scan might have moved along a few lines ... and our split screen has crept from its normal position.

Some possible fixes

There are several possible approaches to fixing this jitter. The one that comes to mind first are complex, in a moment, we'll move on to an easy one.

When the timer interrupt strikes, we could ask it to look at the raster and see if the scan was close to the interrupt point. If so, we might wait things out, or skip part of the timer interrupt jobs.

Meany

The timer interrupt could 'unlock' the interrupt very quickly, using a CIA command. That way,

we could interrupt the interrupt program itself to do the split screen job. Better: but some programmers feel it's dangerous to allow this kind of thing to happen.

But there's an easier way: shut the timer interrupt off completely, and do its various jobs with our own program. This seems very complex, but it's not. We can call the timer interrupt routines ourselves whenever it's time.

Let's look a little more closely into the timing of these interrupts. We expect to cause a raster scan interrupt about 120 times a second. That's twice as often as the timer interrupt needs to be handled. So our raster program could occasionally call in the timer interrupt program.

It seems that we could do the job easily by calling the timer interrupt routines every second raster interrupt. That would certainly do the job ... but there's a better way.

Even though we've shut off the timer interrupt, it's still signalling when the time is ready. Let's review: the timer leaves a signal in hex address DC02 (56333) whenever it counts down to zero. Normally, this signal triggers the interrupt line (IRQ) and causes the processor to be interrupted. But we may break the connection between the timer signal and the interrupt line. In this case, the timer will not cause an interrupt - but the signal bit will still flash when the appropriate time has come.

So here's our plan: we will disconnect the timer from interrupt, and service it ourselves when it flashes. Easier done than said. Let's look at the machine language code:

```
033C A9 01 INTR LDA #001
033E AD 10 D0 STA IRQ10
```

Raster interrupt is now the only game in town, so we don't need to test for it. We must, of course, turn off the raster interrupt flag.

```
0341 A2 62 LDX #862
0343 A0 06 LDY #006
```

Set up for top of screen. Next interrupt, line 92 hex; new colour, number 6.

```
0345 AD 12 D0 LDA SD012
0348 10 04 RPL M04
```

If it's really the top of screen, we can skip ahead. Otherwise, we change for mid screen - line 1, new colour number 0:

```
034A A2 01 LDX #001
034C A0 00 LDY #000
```

Now we're ready to do the job,



whatever the screen is:

```
034E 8E 12 D0 MID STX SD012
0351 8C 21 D0 STY IRQ021
```

The job is done. Now let's see if the timer interrupt is calling for action:

```
0354 AD 00 DC LDA SD000
0357 28 01 AND #001
0359 F0 03 BEQ SKIP
```

If we don't skip, the timer wants attention. Call it in:

```
035A 4C 31 EA JMP $E4EA
```

If we did skip, the timer isn't needed. Cut with:

```
035E 4C BC FE SKIP JMP $EBCF
```

We must remember, of course, to turn off the timer interrupt, set the IRQ vector to our new code, and turn on the raster interrupt. We'll do all that in Basic. Speaking of which ...

Basic-ally Yours

Here's the same program in Basic:

```
60 POKE 53267,27
100 FOR J=628 TO 862:READ X
110 T=T+X:POKE J,X
120 NEXT J
130 IF T<>4077 THEN STOP
200 DATA 149,1,141,25,208,141,
146,160,6,173,10,208,16,4,
162,1
210 DATA 160,6,142,16,208,146,
33,208,173,13,220
220 DATA 21,1,240,3,76,48,234,
76,148,254
300 POKE 56333,127
310 POKE 788,60:POKE 789,3
320 POKE 53274,128
```

Now we have a rock solid colour change at the appropriate screen point. No creeping, no jittering, no hiccups.

Summary

We've only touched upon the techniques of raster interrupt. A whole host of new possibilities open up with its use.

But we've shown it can be done ... and some of the techniques that can be used to do it.

More on sprites.

The sprite that we drew in last month's (February issue) wasn't very big. Here's a way to make it larger in the X and Y directions with addresses 53277 and 53278, respectively.

These addresses are often addressed when an object moves across the screen. If we use them, we can effect a zoom in or out. Try this: **POKE 53277, 1** and **POKE 53278, 1**.

Colouring

A sprite is one colour only - the colour we selected in 53257. The other colour is 'transparent', so it isn't really a colour at all. We may code one sprite in four colours (or three plus transparent, to be exact) but we would need to draw it slightly differently.

Instead of one bit representing either 'colour' or 'transparent', a grouping of two bits will be needed to describe four conditions: the sprite colour (as before), special colour no. 1, special colour no. 2, and transparent. These extra special colours by the way are kept at 53258 and 53259. They are the same for all sprites, only the sprite colour is individual.

Now we come to the last two registers, which tell you about collisions. **PEEK(53279)** will tell you if any sprites have collided with the background since you last checked. It certainly has, of course, if you've been messing around with the screen as suggested.

PRINT PEEK(53279) will yield a value of one, checking the bit table above tells us that sprite zero

has hit the background. Now checking that location clears it, but if the sprite is still touching some of the screen text, it will flip right back on again. Move the sprite to a clear part of the screen. **PRINT** the **PEEK** again - it will likely still say 1, since the sprite has hit characters since it was last checked. If the sprite is safely in a clear screen area, the next **PEEK** will yield a zero.

We've only activated one sprite so that we won't see any signs of collision between sprites. You would see this in location 53278 but right now **PEEK(53278)** will yield zero - unless you have activated more sprites; there would not have been any collisions. Again, when you get a signal here, you'll know which sprites have bumped, and seeing the location clears it, so that only new bounces

will be shown on the next test.

A small comment: these two **PEEK** locations are marked 'interrupts'. Yet when such collisions occur, they are logged; they don't do anything. Now the word 'interrupt' has a special meaning to machine language programmers, and no interrupt seems to be happening. The machine-code programmer who wants interrupts to happen must enable the interrupt by storing the appropriate value into address **D01A** hexadecimal - and then write the appropriate code to make it all work.

This completes our tour of registers, but the plate mechanical facts don't convey the remarkable things that you can do with the Commodore 64. There's more to come.

Attention: Amateur Radio Enthusiasts

Low cost teletype, morse and ASCII for your VIC-20 or Commodore 64!

JUST ONE MODULE TO PLUG IN AND GO!

The "Micropatch" consists of an excellent Terminal Unit together with really user friendly software in one package.

- True dual channel mark and space multi-stage 4 pole, Chebyshev active filters.
- Automatic threshold correction for good copy when one tone is obliterated by QRM or selective fading.
- Easy, positive tuning with triple LED indicator.
- Not a low-cost, low-performance phase-locked loop detector!
- Switch selected 170Hz or wide shift on receive.
- 800Hz multi-stage active CW filter.
- Automatic PTT.
- RTTY anti-spaces.
- Demodulator circuitry powered by external 12V D.C. (not supplied) to avoid overloading host computer and for maximum EMI isolation.
- Exar 2206 sine generator for AFSK output.
- Shielded transceiver AFSK/PTT interface cable provided.
- Plus or minus CW keyed output.
- FSK keyed output.
- Split screen display with message memories and time of day clock.

Price: MP-20 or MP-64 £129.00 inc VAT £1.50 P&P & Ins.

Twelve months parts and labour warranty on all products sold

All prices include VAT @ 15%.
For further details of any product,
please send a large SAE
CLOSED ALL DAY WEDNESDAY

**I.C.S. Electronics Limited, PO Box 2
Arundel, West Sussex BN8 0NX
Phone: (024 385) 590**

NEW



A mind to learn?

Sulis Software has a home education program for you.

ENGLISH

BALLIFF

Age guide 14 to adult.

Content: 1300+ words with difficult and confusing beginnings and endings. These prefixes and suffixes cause great problems, and the only way to learn them is practice.

Before you begin, you are tested to assess your level, and you are scored on the basis of this. You have to work at the spelling until you reach 100% on every round. The game—every time you spell a word right, a guest arrives at your hotel. A mistake, and you lose a guest. If you lose too many, the bank calls in the balliffs. If you do well, you move up to a better



hotel. Balliff! also has a practice option (you select the words you want to study, and work through them without playing the game), an analysis of mistakes, and a survey of words in each section.

BESIEGED

Age guide 15-Adult, for advanced spelling.

Content: 480+ words which are difficult to spell because:

- they have unusual consonant or vowel clusters
- they are of Latin or Greek origin
- they are technical.

You have to recognize each word from the definition and then key it in correctly. Each correct word earns a knight can cross the bridge and go into the castle. Every mistake helps an invader to



reach the castle. After three mistakes, the castle is lost to the invaders. There are different levels of difficulty, and the words come up randomly, so that no two rounds are the same.

OPEN SESAME

Age guide 13+

Content: 480+ words which are commonly used but often misspelt because of similarities like doubled consonants, words with the same pronunciation but two spellings and meanings—such as 'principle' and 'principal'—or words whose pronunciation is no indication of spelling.

The action is set in Baghdad. Ali Baba is trying to get at the treasure in the cave, but it's a difficult task. Even if he gets a group of words right and escapes the bandits who want to kill him, it takes many rounds to get to the final spell which reveals the

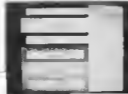


treasure. It's worth it, though—the time you can get fifty words right, with only two mistakes, you know that your spelling has improved. Open Sesame has definitions of the words, jumbled-letter clues, and a choice of level of difficulty.

STARTER AND JUNIOR WORD SPLITS

Age guide: 4+ and 8+

These two word games both use the same techniques, but with different words—concrete words for younger children, grouped



understanding, more complex words which are difficult to spell for older children. Word Splits helps children with spelling and vocabulary in a lively and original way.

The aim is to join the split words to their other parts. Six split words appear on the screen, and you have to shoot in the right match to make complete words. It sounds easy, but it's great fun, and there

ENGLISH

WORDPOWER

Age guide 11+

Content: 1200+ words in five sections: synonyms, similis, collectives, nouns and their adjectives.

The purpose of Wordpower is to expand vocabulary and improve spelling. Most people suffer from a 'rusty code'—they use the same words and sentences again and again because they don't know how to say or write the same thing in different ways. Wordpower enriches your use of language by showing you alternatives and



making you use words accurately. Start with one of the two games—'Lenses' is easier than 'Shooting', and then when you are sure you know the words, get the spelling right with the writing option.

FRENCH

JUST A MOT

Age guide 13 to adult

Content: 500 French words arranged in five groups: Food and drink, Shopping, Travel, People and Essentials.

Just a Mot consists of two games and a writing option. Use the games to get familiar with these useful, idiomatic words. Then make sure you really know them by selecting the key-in option. You can work from English to French or vice versa, and the choice of speeds means that once you know the words, you can really build up fluency. No more long pauses while you try to think of a suitable word! And you needn't have any worries that these words are the usual English classroom ones.



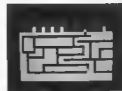
which are either plain wrong or so peculiar that no French person would ever use them! Our programs are vetted meticulously by native French speakers. Just a Mot provides an excellent vocabulary for holiday or business travel, for students or for people who just want to brush up their half-forgotten French.

HISTORY

TIME TRAVELLER

Age guide 7 to adult

A romp through five major periods of English history. It questions you on each age, and then lets you loose to be chased by wild beasts (in the Bronze Age), legionaries (Roman Britain), priests and prelates (11th century), palace guards (16th century) and gnomes and rats (in a 19th century sewer). You have to amass a huge score to get back to the 20th century, so after progressing through the ages in chronological order, you are allowed to choose your age to go



back and get more points. Time Traveller will fix a lot of facts and dates in every player's mind, as well as providing an enjoyable and challenging game.

If you would like the opportunity to look at our programs in your own home, send for a demo cassette or disk showing all these programs in action. The cassette costs £1, and the disk £2 (refundable against order).

Or ask for our free colour catalogue.



Write to: Sulis Software Ltd,
FREEPOST, 4 Church Street,
Abbey Green, Bath, BA1 1FP,
or if you prefer, ring 0225 61929/66206.

Our promise: every time you sit down to a Sulis program, you'll enjoy yourself—and you'll learn something.

Assembly

may not be the most flexible source code, but it has a few memory advantages. It is a code that it allows you to store source code on disk or cassette, and also assemble into RAM. If on disk or cassette, you can run ASM in works off the functions keys. It starts an assembly by asking you for the filenames. This is a double purpose: it identifies the file on disk or tape, and the suffix you add tells it where to get the machine code and send it to the printer.

The suffix is made up of one or three characters. The first two are used to name the source code. Where the source code is from - it can be M, for disk or cassette, Memory Keyboard, and User-written device.

That last one would allow you to use any fancy storage devices you get running on your machine (Winchester disk? Micro-drive?), but you'd have to write your own input and output routines. I'm certainly not a task force beginner.

The second character indicates where the assembler listing goes, the third specifies the destination of the machine code. The same input options apply, but in assembly you can send to the printer, P, or discard completely, (D).

With a source file name like PROG.MEM, the assembler will pick up the file PROG.MEM from disk or cassette (whichever you specified when you bought the system), list the assembly on the screen and put the machine code in a file named like PROG.MEM

will assemble from RAM without listing and put the code back in memory.

This is about the best way of producing code very quickly - I can assemble a large source file of about 5K in under a minute, taking 37 seconds with code. It is just a bit slower when not producing any code.

If the code is assembled to disk or tape, it is sent out in hex format. The Commodore assembler is the same. It must be loaded as machine-code and then run out.

The other function key is to examine disk files. It loads, lists, and erases disk files. It also loads, lists, and erases files having the extension .asm, .machine, and .hex.

Once you have loaded the code, you can enter the assembler to get from the assembler to the editor. You press F3 (execute machine-code) and enter either 'C' (cold start - wipes all text) or 'W' (warm start - preserves existing text). I didn't like this aspect of Osiris; there should be a better linkage between the two programs - perhaps allowing the assembler to pick up the last address when you assemble from RAM.

Once you have entered the values it needs (where the source starts, what the symbol table should be built), these are retained as defaults and used subsequently if you just press return.

A wide range of directives and pseudo-ops are available, so that you can control the format of assembly listings and link to source files if they won't all fit in memory at the same time. *Spent hours on my complaints*

about the search and replace facilities, I can only recommend Osiris to anyone who wants to write a large program. The one significant omission is the ability to relocate machine code to a different address. At about \$20 it is good value for a professional product.

Mikro

At £1.75 Mikro is quite a three times the price of Osiris. But if you want the luxury of a cartridge accessible version, it works with Basic. It is certainly worth a look.

The Vic version is not just an assembler; it also has code for graphics, sounds, and so on. These have been added to the 64 version, which is only a machine-code assembler system.

Unless you have a motherboard the Vic version gives you only 5K to play with. On the 64 you're left with 48K when you switch on.

Mikro works at Basic level, so you enter the source programs as in the same as entering Basic programs. You can write and run Basic programs with Mikro plugged in. But you cannot mix Basic and machine programs. A typical chunk of source code looks like this:

```
4400 NTK CMP #101
4410 BNE MOVE
4420 JSR CHECK1 CHECK
4430 JSR HORIZONTAL MOVE
4440 LDA #0
4450 STA MYAR+1 JUMP UP
4460 LDA #0 VERTICALLY
4470 JUMP UP
```

4470 STA MYAR+1 ALSO 4480 DONE RTS

If you need to change the code, you can simply list the source section and change it. You would with a Basic program.

All Basic programs work as usual, apart from the memory you'd hardly notice that Mikro was there. It's like to keep it plugged permanently, but it's a game which you can't play if it isn't. I wrote the review and the code also has a source code.

There are several commands available. Mikro is like a lot more. For instance, FORMAT is a command to LIST but the listing comes out very nicely in columns. So FORMAT 4480 would produce:

```
4450 STA MYAR+1
4460 ! SET UP DIRECT
4470 VERTICALLY
4470 STA MYAR+1 ALSO 1
```

4480 DONE RTS

Programs can also be listed to the printer by doing an OPEN, CMD and FORMAT. A Commodore parallel printer interface is in (programmed in software) so you can plug a printer cable directly on. This uses port 4 as device 1. It can be used from Basic with OPEN 1:device, OPEN 14. Very nice indeed. DELETE is a much-needed command which removes lines of program. But I think there's a bug in it if you delete from the end of the program. (DELETE 4450 - say) this seems to corrupt the end of the program.



NEW!

AMAZING NEW SPEECH SYNTHESISER FOR YOUR COMMODORE 64

ALLOPHONE BASED SPEECH WITH AN UNLIMITED VOCABULARY

● New basic commands give full control over all speech functions ● Approximately 200 predefined words built-in ● Speech may be produced simultaneously with graphics and sound ● Extended Basic commands are very powerful and are well proven on our other speech synthesisers ● This must be one of the most advanced and comprehensive speech synthesisers available today
Rarely has anything been so easy to use on a Commodore 64.

Order now by sending cheque, P.O., Access number to —
J.C.B. (MICROSYSTEMS),
29 Southbourne Road,
Bournemouth, Dorset, BH6 5AE
Tel. (0202) 423973.

Dealers — please contact us now.
Never have our terms been better.



Speakezy

All this at
an amazingly
low price of
£34.95

+ 75p p.p. VAT incl.
Splitter lead for use with monitors £1.50

J.C.B. (MICROSYSTEMS)

Introducing

for **COMMODORE 64**
the **MST ADMINISTRATOR**
ON TAPE & DISK

A USER-DEFINABLE
INVOICES & STATEMENTS
FORMATTER &
DOCUMENT GENERATOR
● A COMPILED PROGRAM

THE ADVANTAGES OF WORD PROCESSORS & SPREADSHEETS
COMBINED IN THE NEW AND EXCITING PROGRAM FROM MST

- Format & Print your own documents, or use those provided.
- All VAT, discount, totalling calculations done automatically
- Use plain English — No programming needed
- Use plain paper or continuous pre-printed stationery
- Compiled program for high operating speed
- ★ User-defined footer messages
- ★ Double or single size characters
- ★ Save documents and use when required — SALES & PERFORMANCE INVOICES, QUOTATIONS, DELIVERY & PACKING NOTES, ADVICE NOTES, STATEMENTS, REMITTANCE ADVICE NOTES, ETC

PLUS HORACE HELPER ON DISK PROGRAMS

Also available: **MAILER/ADDRESS BOOK**, and **STOCK CONTROL SYSTEM**
MORE FACILITIES at NO EXTRA COST

Tapes: £19.95 inc. VAT* Disks: £24.95 inc. VAT* (*UK only)

DEALER ENQUIRIES WELCOME

Tick the appropriate box. Prices include postage and VAT

TAPE £19.95 EACH INC
☐ MAILER/ADDRESS BOOK
☐ STOCK CONTROL
☐ ADMINISTRATOR

Cheques etc. should be made payable to MST CONSULTANTS

NAME

Address

Card Number

MST Consultants, Nibleton Road, Bovey Tracey, Devon TD13 0BB Telephone (0828) 932817

DISK £24.95 EACH INC
☐ MAILER/ADDRESS BOOK
☐ STOCK CONTROL
☐ ADMINISTRATOR

Signature



MST
CONSULTANTS

Cost effective
business software
for home computers

The solution is to specify a range of lines instead.

There is also a known bug in the current version (no. 3) of Mikro - if you enter a line including px (shifted up-arrow) the machine jumps into TIM - the machine code monitor - and crashes.

Once it locked up my machine entirely and I had to switch off.

Other commands are AUTO, which displays line numbers when you are entering the program, and NUMBER, which shows any number (0 to 65535) in decimal, hexadecimal, octal (who uses that nowadays?) and binary. You can type in NUMBER \$A000 and this will show

```
$A000 40560 %1000000
%101000000
0000000
```

All commands can be shortened like normal Basic commands (F shift O for FORMAT, A shift S for ASSEMBLE, and so on).

TIM is an extended version of the machine-code monitor which most Pets come with. It has commands for searching, moving and disassembling machine-code programs as well as entering, saving and loading them. If a BRK instruction is ever executed, then TIM is also entered (try SYS 3).

One of the extra commands the most useful is DISASSEMBLE - this has also been provided as a Basic command. Type 'D Shift I SE456-' and it disassembles from SE456 onwards, stopping after every page until you hit space or run/stop.

The most important part of Mikro is of course the assembler - and it is quick. One utility program I have is 19K long. Mikro assembles this into 2200 bytes of machine code in 14 seconds.

The assembler works in three passes, first checking syntax and labels and then producing machine code. It generates the code very cleverly by writing it into the RAM beneath the kernel ROMs and I/O chips; when complete the code is copied into your specified area. In this way all 64K of memory in the machine can be used.

The symbol table which holds all labels can be up to 12K long and is partly stored under the Basic ROM. It would be a very unusual program, perhaps one in several linked parts, which would overflow this - the capacity is approximately 1500 labels of six characters each.

(Ostrisan can assemble into the

ROM as this will go into the RAM beneath, but you have to use the normal RAM for the symbol table and don't go near the I/O page or a crash will swiftly follow.)

The LINK command allows one source program to chain another in on the end of it. This would permit very large sources to be assembled in one go - perhaps as much as 100K. But it would be very slow with three loads of each program (one per pass).

The assembler mnemonics are standard 6502 format. The usual BYT, WOR and TXT pseudo-ops allow tables of values or strings to be set up in RAM. BYT however is a little restrictive as you cannot mix long text strings with numbers on one line. A line like 'BYT 48, "HELLO", \$1D' (which Ostrisan and Commodore allow in their assemblers) has to be split over three lines.

```
BYT 45 "HELLO"
TXT $0D
```

Or else you could use the equally clumsy BYT 45, 'H'E'L'L'O \$0D'. It would be useful if Mikro would allow a mixed line.

Only one error is detected when assembling. So if you type in a large source with a few syntax errors, it will take a little bit of time to identify and remove them all. The error messages are given as in Basic, and you can immediately list and correct the offending line.

After a successful assembly the TABLE command will list out all the symbols and their values in alphabetic order. It is intelligent enough to output these in four columns if you do a CMD to list it on a printer.

There are some annoying omissions in Mikro, and those you'll have to rectify yourself. Renumbering is vital if you are moving or inserting new lines and is not very difficult to program as only two bytes have to be changed in each line. It should have been included as a command. Search and replace are not included either, though the FIND command will locate and list all the lines for any string you specify.

Being able to have multiple statements on a line would be a good way of getting much more text into the limited 30K memory. There is an overhead of five bytes per line, so '10 TYA takes eight bytes rather than four (three characters plus terminator).



I had to write a small package to supply renumber and disk commands as Commodore's DOS wedge stops Mikro correctly assembling. But I've been using Mikro for several months now and it is my favourite (over Ostrisan) by just a whisker.

Mikro is not cheap when

compared with Ostrisan or even Commodore's own Assembler Development package (£25.00); and it cannot assemble to disk or cassette. Its main advantage is speed and convenience - there is no need to muck about with separate editors and assemblers.

Under review	UF 6502
Description:	Assembly language for Vic
Supplier:	(mail order from) Syd Pidd
Address:	Aldie, York YO62 2LQ
Summary:	Interesting idea, but desperately needs better presentation
Price:	£12

Under review	Ostrisan
Description:	Editor and Assembler for Vic +8K or 64
Supplier:	Elmhirst Enterprises
Address:	99 Forchester Road Huddersfield Glooucester
Telephone:	0452 64938
Summary:	Only one serious caveat - but professional and good value
Price:	£19.95 (cassette) or £22.95 (disk)

Under review	Mikro
Description:	Editor and Assembler on cartridge for 64
Supplier:	Supersoft
Address:	Winchester House Canning Road Waldstone Harrow
Telephone:	Middlesex HA3 7JF
Summary:	01-861 1166 Needs RENUMBER, but very convenient and well presented - recommended
Price:	£50.00

Anger Productions

CBM 64 Software



YANTZEE

Play this very sinister old Chinese dice game, either by yourself or with your family and friends. (Up to 4 players) This Chinaman uses 3 dimensional dice!

Cassette game £9.95p



ASSEMBLER

Help yourself to learn how to write, read and copy your own machine code programs. Some knowledge of machine code is preferable to maximise the use of this tape



Cassette game £7.50p

LIFETIME REPLACEMENT GUARANTEE

To order just complete the coupon and mail it to us with your remittance

Name	Flight	£9.95	<input type="checkbox"/>
Address	Golf	£7.50	<input type="checkbox"/>
	Yantzee	£7.50	<input type="checkbox"/>
	Assembler	£6.95	<input type="checkbox"/>
Any combination of programs available on Disk £2 extra			

ANGER PRODUCTIONS 14 The Oval Brookbourne Merts EN10 6DC

OVER
400
NOW IN
USE

For VIC 20 and
CBM64 Users

SIP ACCOUNTING SYSTEM

Highly comprehensive program designed for 16K, 24K, VIC20 & Printer, 40 col VIC20, CBM 64. Makes an ideal introduction for you and your staff to the world of computer accounts

LEDGER MODULE

- Features include:
- Menu driven - simplicity to use*
 - Up to 250 accounts per tape disc
 - Day book
 - Sales and purchase ledger (or just 1 type)
 - Invoice print module available as extra
 - Statements print
 - For all or just one company
 - Overdue account statements (on above)
 - End period copy on to cassette tape disc
 - Cash summary - debits and credits
 - VAT entry (or gross)
 - PLUS many, many more features
- on CBM programs
- SIP/ACB - VIC20 16/24K Type Based
SIP/DCB - VIC20 16/24K Disk Based
SIP/ACB - CBM64 Type Based
SIP/DCB - CBM64 Disk Based
- Tape Version £24.95 + VAT
Disk Version £29.95 + VAT
- Price includes comprehensive manual
+ data tape for tape version or manual
Suitable for all Commodore printers, either a compatibility with others

Printer prints

• General ledger, sales ledger, purchase ledger, day book, cash summary, debits and credits, statements, overdue account statements, end period copy on to cassette tape disc

INVOICE PRINT MODULE

• Invoice print (on above)
• Invoice print (on above)
• Invoice print (on above)
• Invoice print (on above)

Tape Version £24.95 + VAT
Disk Version £29.95 + VAT

Please specify machine size when ordering
Available for hire to leading UK business
Send your order to the nearest branch
Information 01-256 0000 or telephone

Simple Software Ltd
111 Lambeth Road, London SE1 8PP
Telephone: 01-256 0000
Telex: 840100 SPT SPTA CL

NEW FOR THE CBM64 INCENTIVE THE SPLAT CHALLENGE

SPLAT!



NEW
FOR THE CBM64
THE SPLAT CHALLENGE FOR THE COMMODORE 64
£6.50

INCENTIVE
SIMPLE SOFTWARE 54 LONDON ST
READING RG1 4SQ (0734) 581678



ULTRADYNAMIC!
COLOSSAL!!
Fantastic!!!

No. It's just not US....

When we started Simple Software Ltd in 1979, we didn't call it Hyper galactic Megaware. Our kind of customer wants value (rather than inflated claims), reliability and ease of use rather than hype, helpful advice rather than a lousy pack off the supermarket shelf.

We sell to people who want to USE their computer. We sell games too, we're not a game bunch, but it's our DBMS our Word Processor our Assembler etc, that earns us our surprising lot of customers. Of course we don't suppose that K1 use Simply File, but all their things. Possibly the CDBS use something more than a File to control the national grid. We even understand that the BBC have some other kind of computer. But they like small businesses, club secretaries, accountants and teachers are just as quick to see us as the Ford, British Telecom and Hong Kong University. Occasionally even Big Brother is keeping at least one eye on a Commodore with Simply File in it.

SIMPLY FILE DBMS (64, 40/80 PET). There is nothing better at any price for our use. (Customer above) £80 + VAT (PET £85 + VAT)

SIMPLY WRITE Word Processor (64, Vic-20, PET 40/80). Good enough for business, cheap enough for home use. We write our manuals with it. Disk £40 + VAT, tape £35 + VAT (PET £45 + VAT extra)

NEW! SIMPLY ASSEMBLER package for machine code (64, PET). It has never been easier yet even out experts pale in it. Tape or Disk £22 + VAT £4 or PET

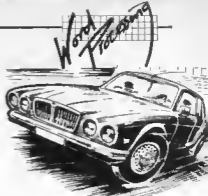
From your despatch or from us. Write or phone for full details and free MicroMail newsletter

SIMPLE SOFTWARE LTD
15 Havelock Road Brighton Sussex
Phone (0273) 804879

Word processing round-up

The best and the rest

by Chris Durham



There is no doubt that most micro computer manufacturers would like you to believe that their computers will be all you need, together with a printer and a suitable bit of software, to produce professional looking documents and letters, with little or no effort. The very thing every small business has been looking for just what you need for all those letters you currently slave over a typewriter to produce.

Commodore is no exception to this. Many of its ads depict a businessman moving from office to home using his trusty CBM 64 for everything from WP to games.

Just how sensible is this? Can the CBM 64 really be as good as a dedicated word processor system costing over three thousand pounds?

Or can the under-£100 WP programs available for the 64 compare with the £300-plus packages sold to users of £2,000 business micros?

The simple answer is - maybe! It really all depends what you want to do with your word processor.

What is a word processor?

In its very simplest form a word processor is a program that can input, amend and print text. You aren't confined to producing the final version as you go which is the main difference between WP and a typewriter: you can edit, chop and change, store and recall your text before you commit it to its final printed form. And that should all be done in

a manner which is easy for the user to use and understand. Input and output are fairly straightforward operations for the software; it is the editing part of a WP program that can let it down badly. Few people are perfect typists and one of the great joys and advantages of word processing is that it allows you to correct errors quickly without having to retype the whole document all over again. But all the virtues of word processing count for nothing if the editing procedures are so difficult to use that they can't deal with simple errors without the sort of manipulation which would put Paul Daniels to shame!

The basic editing requirements in any WP operation are:

- overwrite single character errors
- insert or delete single characters
- insert or delete multiple characters
- insert or delete whole lines of text

With these basic capabilities you can carry out most editing tasks. The majority of word processors however have considerably more facilities than these. Other common functions you can expect are:

- move whole blocks of text to a different place in the document
- copy whole blocks of text to another part of the document, leaving the original unchanged
- find the first (and subsequent) occurrences of a word or phrase
- replace any or all (or selected) occurrences of a word or

phrase by different text

These begin to open up the real advantages of a word processor, whole paragraphs can be moved about in the document, phrases can be juggled until they look correct, changes to standard letters can be made quickly and easily.

Combine these features with a choice of output formats, facilities to allow documents to be saved or reloaded on disk or tape, options to allow all the features of your printer to be used, and the ability to print standard letters with different inserts and addresses in each one, then you have a word processor which is capable of doing most jobs you are likely to want.

It may surprise some people to learn that programs are available that allow the CBM 64 to do all these - and more!

Word processing on the 64

Compared to many home microcomputers, the CBM 64 has many features which make it a good machine for WP. It has a superb full-sized keyboard with a good 'feel'. It has a number of control and function keys - which can be used to simplify WP commands. It has a built-in full screen editor that also facilitates amendments. It has sound to warn you about mistakes or potentially dangerous edits. And it has all that colour to improve the legibility of text.

Sadly not all WP programs take advantage of these. Programs written specifically for the 64 (or - with some

reservations - conversions from other Commodore machines) therefore tend to be a better choice than those word processors originally written to cover a wide range of computers.

One thing prevents the CBM 64 from being an ideal word processor: the maximum of 40 characters per line on the screen. All commercial WP systems have an 80-column display, allowing much more of the document to be seen at once - and corresponding more closely to the length of line that you'd want on the typical printed document.

There are ways of getting round the problem and designers of WP packages for the 64 have used them all. First the program can accept the text in 40 columns, then reformat it when the document is printed, thus we can summarise as 'format on printing'.

Alternatively the package can make the document the full width required and use the screen as a 'window' that can be scrolled across the text ('format as you type').

And third, you can use a hardware converter to display the full 80 columns on a monochrome monitor.

These methods all have their drawbacks - even if it's only a matter of cost, as with the hardware adaptor approach. The other two are more commonly used, and the choice comes down to personal preference. I much prefer the 'format as you type' approach, other people prefer to see all the text on the screen at once.

• available on
me 64

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

Program PAPERCLIP

Format disk

Price £98.90

Summary: Wealth of facilities including column manipulation addition and subtraction, sorting - probably the most comprehensive WP available for the 64. Excellent printer options. Good manual. Formats on printing, but option for horizontal scrolling for column work etc.

Supplier: Kobre Micro Marketing

Address: PO Box 28
Hendon-on-Thames
Oxfordshire RG9 1FF

Phone: 0491 572512

Value for money 0.5

Reviewed March 1984

Program THE WORD

Format disk

Price £225.25 (includes Video Pak 60 and other software)

Summary: Paperclip on an 80-column screen - comments on Paperclip apply equally to this version. Format still only on printing although you can preview 80-column documents on screen.

Supplier: Impex Designs (UK) Ltd

Address: Metro House
Second Way
Wembley
Middlesex HA9 0TY

Phone: 01-900 0999

Value for money n/a

Reviewed coming in July

Program WORD-MANAGER

Format disk (80-col) case (40-col)

Price £142.00 (disk, includes 80-col board), £19.95 (case)

Summary: Comes free with Impex Video Pak 80. Ideal for small letters, though limited. Very easy to use. Formats as you type. (Casette version is for use without 80-column unit).

Supplier: Impex Designs (UK) Ltd

Address: Metro House
Second Way
Wembley
Middlesex HA9 0TY

Phone: 01-900 0999

Value for money n/a

Reviewed coming soon

Program VIZAWRITE

Format cartridge or disk

Price £79.95

Summary: Written specially for the 64 - uses 64 facilities to the full. Easy to use, especially as cartridge. Very good facilities. Has associated spelling checker (Vizaspell). Formats as you type with 40-column width option.

Supplier: VIZA Software

Address: 9 Mansell Row
Brompton
London SE16 6JH
Kent ME1 5SE

Phone: 0634 913790

Value for money n/a

Reviewed February 1984

Program WORDPRO 3 PLUS/64

Format disk

Price £92.00

Summary: Seen around a long time, rather dated in some respects. Compatible with other IBM versions. Good range of facilities plus an excellent manual. Formats on printing.

Supplier: Wega Computers Ltd

Address: 22a High Street
Caterham
Surrey CR3 5UA

Phone: 0633 48218

Value for money 0.4

Reviewed April 1984

Program QUICK BROWN FOX

Format cartridge or 80 column board with WP included

Price £69.00 (cart), £142.00 (80-col)

Summary: A lot of good facilities let down by poor editing method. Does not take advantage of the facilities of the 64. Very good manual. Formats on printing.

Supplier: SPT Electronics Ltd

Address: Tolleshbury
Dassas CM8 8SE

Phone: 0623 868464

Value for money 0.5

Reviewed December 1983

Word Processing Road Test:

ANIROG

*The Name
For Quality
And
Innovation*

Flight Path 737



ADVANCED PILOT TRAINER

Written by a flight simulator instructor and pilot.
Superb graphics. COMMODORE 64 VIC 20 16K **£7.95**

TRADE ENQUIRIES: ANIROG SOFTWARE LTD, 29 WEST HILL, DARTFORD, KENT, (0322) 92513/8
MAIL ORDER: 8 HIGH STREET, HORLEY, SURREY, 24 HOUR CREDIT CARD SALES, HORLEY (02934) 6083
PAYMENT BY CHEQUE, P.O., ACCESS/VISA, 50p POSTAGE & PACKAGING



The problem with buying a home computer, as you may already have discovered, is there's often very little software to go with it. Or all that is available is games, games and more games.

There's no such problem, however, with the Commodore 64. It has a more extensive range of serious software than any other home computer.

It also has an unusually large (in fact elephantine) 64K memory, as well as every peripheral you're ever likely to need.

Put simply, this means the computer has the capacity to run more interesting, entertaining and complex programs.

You can teach yourself just about any subject

you care to mention, even computer programming.

And for the office there are programs like word processing, financial planning, information storage and stock control.

Finally, when you're mentally exhausted, you can even entertain yourself – yes, with games.

When all's said and done, however, we do have to admit that in one respect the Commodore 64 isn't up with the competition. It costs around £229, much less than any comparable machine.

And that's a fact we hope you'll never forget.





**When you have an
enormous memory there's no end
to the things you can do.**

Please send me further information on: the 64 computer ☐ 64 software ☐
disk drive ☐ cassette unit ☐ printers ☐ monitor ☐

Name [Mr. Mrs. Miss] _____

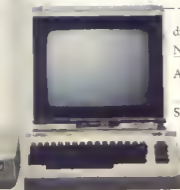
6SCOU284

Address _____

Send to: The Commodore Information Centre, 675 Ajax Avenue, Slough,
Berkshire SL1 4BG. Or telephone (0753) 79292.

 **commodore**

6SCOU 0584



Program	WORDCRAFT 40
Format	cartridge
Price	£69.95
Summary	Long favourite of IBM users, compatible with Pel and Vic versions. Good range of commands that are easy to use. First edition of manual rather poor. Formats as you type.
Supplier	Audiogenic Ltd
Address	34-36 Crews Street Reading Berkshire RG1 2SN
Phone	0734 586334
Value for money	6.4
Reviewed	January 1984

Program	SCRIPT 64
Format	disk
Price	£80.00
Summary	Built-in spelling checker. Uses non-standard method of file storage with manually updated directory. Reasonable facilities. Good selection of print options using a control map. Formats on printing, but options for some format as you type. Commands.
Supplier	Implex Designs (UK) Ltd
Address	Metra House Second Way Wembley Middlesex HA5 8TY
Phone	01-900 0599
Value for money	6.5
Reviewed	to be reviewed

Program	WORD WIZARD 64
Format	Cassette
Price	£5.99
Summary	Very low cost very basic program for single-page letters only - adequate for what it sets out to do. Formats on printing, although tabs etc are formatted on screen as well.
Supplier	Bubble Box
Address	37 High Street Yorkshire Leam TN9 1RX
Phone	0732 355462

Program	EASYSRIPT
Format	disk
Price	£75.00
Summary	Commodore's own product, written specifically for the 64 (by Precision Software). Good range of facilities. Easy to use and has an excellent manual. Has an associated spelling checker (Easyspell). Formats on printing.
Supplier	Commodore Business Machines
Address	675 Ajax Avenue Slough Berkshire SL1 4BG
Phone	0753 748282
Value for money	6.6
Reviewed	October 1983

Program	SIMPLY WRITE
Format	cassette or disk
Price	£35.75 (cass), £46.00 (disk)
Summary	Written in Basic. Reasonable range of facilities, good range of printers supported. Current disk versions have full error-checking. Reasonable manual. Formats on printing.
Supplier	Simple Software Ltd
Address	15 Nevillock Road Brighton Sussex BN1 0NN
Phone	0273 504626
Value for money	6.7
Reviewed	November 1983



	SIMPLY WRITE	QUICK BROWN FOX (40 COL)	QUICK BROWN FOX (80 COL)	WORDCRAFT 40	PAPERCLIP	VIZAWRITE	SCRIPT 64	WORDPRO 3 PLUS 64	EASYSRIPT	WORDMANAGER (40 COL)	WORDMANAGER (80 COL)	THE WORD	WORDWIZARD 64
Price (nearest £)	£46	£69	£143	£90	£99	£80	£80	£92	£75	£20	£142	£224	£6
Use of 64 facilities	2	1	1	4	4	5	3	2	4	2	2	4	2
Editing	3	3	3	4	4	5	4	3	4	2	2	5	1
Ease of use	3	1	1	4	4	5	3	3	4	4	4	4	3
Output formatting	3	4	4	4	4	4	5	4	4	3	3	4	2
Printer support	4	4	4	3	5	3	4	2	3	2	2	5	2
Document size	3	4	4	3	4	5	4	3	4	2	2	4	1
Manual	3	4	4	2	4	3	3	5	5	3	3	5	2
Disk/tape facilities	2	4	4	4	5	5	3	4	5	3	3	5	2
Mail merge	4	4	4	4	5	5	1	5	4	2	2	5	1
Error handling	3	4	4	4	5	5	3	3	5	3	3	5	3
Spelling checker	0	0	0	0	0	2	4	0	2	0	0	0	0
80-columns option	0	0	4	0	0	0	0	0	0	0	4	4	0
Overall facilities	3	4	4	4	5	4	3	4	4	2	2	5	1
TOTAL POINTS	33	37	41	40	49	50	40	36	40	28	32	53	19
Value for money score	0.7	0.5	0.3	0.4	0.5	0.6	0.5	0.4	0.6	1.4	0.2	0.2	3.1

"ADVENTURES INTO IMAGINATION"



Your quest is to escape from Scarthorpe! — a run down 20th Century Suburb where even the dogs carry flick knives. Where there's only one road in, and that's a one-way street. And even fewer leave... the streets are deserted... now is your chance to escape from over 90 crime locations.
£6.50 Cassette £9.50 Disk



All these adventure games are also available in Cassette format for 48K Spectrum.



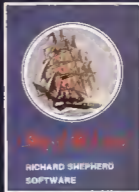
A spine chilling maze adventure... enter via the dungeons... navigate your way through 500 3-D rooms... survive the swooping vampire bats... reach the terrifying top... and rid the world of the evil Count Krepper! Can you survive the top of the tower?
£6.50 Cassette £9.50 Disk



Conquer the world's highest peak in defiance of all the obstacles, rain and * nature can throw at you. Survive avalanches, cross bottomless crevasses, cope with wayward Sherpas — but don't run out of supplies!
£6.50 Cassette £9.50 Disk



Follow the trail of Dr. Death through complex puzzles, coded messages and 3-D mazes until you find his lair! But beware... even with your death-defying gadgets you may not live to tell the tale!
£6.50 Cassette £9.50 Disk



Command a sailing ship, juggle your supplies, crew and firepower. Fearlessly battle your way up the admiralty ladder, bribe Sea Lords as necessary until you make First Sea Lord!
£6.50 Cassette £9.50 Disk

RICHARD SHEPHERD SOFTWARE

ELM HOUSE, 23-25 ELMHOTT LANE, OPPENHAM, SLOUGH, BERKSHIRE.

CREDIT CARD HOTLINE 04286 69351 (24 HOURS)
PLEASE REMEMBER TO STATE DISK OR CASSETTE

All programs are copyrighted by the trademark they display and, for sale of trade or otherwise, for sale, must also, except to commercial customers without any written agreement, be marked "Richard Shepherd Software Ltd."

PRIORITY MAIL ORDER

Prices include UK post & packing overseas add £1.50

Name _____		Signature _____	
Address _____			
I enclose cash/cheque/PO £ _____		payable to Richard Shepherd Software	
Or debit my Access/VISA Card Number _____			
City _____	Game Ordered _____	<input type="checkbox"/> Tick 64 Version Required <input type="checkbox"/> Disk <input type="checkbox"/> Cassette	48K
_____	_____	<input type="checkbox"/> Disk <input type="checkbox"/> Cassette	_____

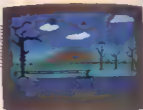
Credit Card Hotline 04286 69351

PLEASE REMEMBER TO STATE DISK OR CASSETTE

Betch'a can't play just one . . .

Flying Feathers

In this highly original game you are the gamekeeper on the lake trying to stop greedy eagles taking all the fish. Two different methods with 4 skill levels each are available for your shot gun. Specially scored music with freeze frame ability, and for the technically minded 10 apries (yes, that's right, there are only 8 on the 84). High scores kept. All machine code.



Bumping Buggies

Thrills and spills is what you'll get in this highly addictive motor racing game. You'll be driving over some pretty hazardous terrain having to cope with lakes, islands, rock formations and, not least, other cars which are intent on making you crash. Luckily you can vary your speed and line and you have one ace up your sleeve - when you maintain a sufficient speed you can jump over obstacles to help you out of trouble. The track gets progressively more difficult with 20 different patterns and you have to cope with driving conditions in the four seasons of the year. Like most bubble bus classics, Bumping Buggies has its own specially scored music and is in machine code.



Only
£6.99
each



bubble bus software

magical products

for your

Commodore



For details of our complete range of products for entertainment, home and business send a stamped, addressed envelope

If you have any trouble buying our products, you may order direct from

bubble bus software
87 High Street, Tonbridge
Kent TN9 1RX Tel: 0732 355962



★★★★★★★★★★★★

We're looking for top quality programs for Spectrum, BBC, Dragon and all makes of popular micro's - send yours in today for a speedy evaluation.

★★★★★★★★★★★★

Bubble bus products are available from:

LIGHTNING and SPECTRUM DEALERS, LASKY'S GREENS, SELECTED HAVY SHOPS, JOHN MENZIES, GAMES WORKSHOPS, CENTRESOFT, W H SMITHS and PC'S STOCKISTS



COMMODORE User

A PARADOX PUBLICATION

Welcome to DEALS FOR READERS, a collection of Special Offers from Commodore User Magazine.

This Catalogue offers you excellent deals on Vic and 64 products. Some of them, like the datascopes and the Vintales tapes, we have produced ourselves. The others are things that we regard as Good Ideas and Good Value, mostly items we reviewed in Commodore User before we decided to sell them. Or most of those we have fixed up discounts for readers (while we aren't allowed to sell books at cut price, we can include P&P in at price).

If you want to take up any of the offers, just use the Order Form on the back page. And turn a look through the Catalogue, even if you don't want to buy now, we'd like to know what you might be interested in seeing in future DEALS FOR READERS catalogues - let us know in the space provided on the Order Form.

DESIGN YOUR OWN VIC SCREENS



Brilliant work, though it's simple really. The Cybergram Design Vic-20 Graphics Add Pack is a set of overlays and printed sheets on which you can design screen displays. With 14 handy hints, you can immediately see the POKE instructions you need for display and colour, and you can use successive sheets to set up a specific 'storyboard' from which to organise and visualise the sequences in a graphics program.

Your pack includes planners handy for the standard 22 x 23 screen and printer sheets for 1023 x 1023 bytes, graphics memory, the Super Expander, you also get a set of handy character designer sheets that simplify the construction of your own shapes.

Very neat, very clever - and really useful too. We're glad we can offer the Graph-A-Pack to you, and at a discount on the normal RRP of £4.50.

Deals for Readers

Video Splitters Aerial and computer both on your TV! Video splitters

This nifty little gadget plugs into the aerial socket at the back of your TV set, and it means you can have your Vic/64 and the aerial all at the same time.

No more boring fiddling around to change the plugs, no more unnecessary strain on the wiring!

£1.75



Instant database for your 64 INFOTAPE

Why buy lots of different data storage systems when just one will do? INFOTAPE 64 is a powerful yet easy to use database system for tape users, and stores up to 3,000 data items with you defining the number of fields per record. Totally flexible, and intelligent in nature, with the user having command of what data is stored and how. And file characteristics may be changed after the file has been created. Powerful 19-instruction calculator is built-in (giving spreadsheet capability), batch processor can update and delete all selected records. A full report generator is included to provide anything from a gimmick label for a mail shot to tabular reports.

Normal price: **£16.95**
OUR PRICE: **£9.95**



Special Offer: When you upgrade your system to use a disk drive, INFODISK will be able to retrieve your tape records - and your INFOTAPE order from us comes with a £20 off voucher against the disk version.

A RECOMMENDED ASSEMBLER for Vic or 64

Tape: £17.95
Disk: £19.95

Our reviewer (June 1983 issue) concluded that Elmhiral's OSIRISAN assembler was "good value at the price". So we signed up to sell it.

Fast, commonsense operation, good features and lots of them, full error-reporting: what more could you ask of an assembler? Except maybe an editor package.

And - would you believe - it comes with EREDITOR, a general-purpose editor that can be used for anything as a mini-word processor and/or to create a source file for the assembler. Features save, move, erase, search, list and replace.



FALLING APART? ORDER FORM ON BACK PAGE

Our Commodore magazine binder holds 12 issues of the magazine (and Via Computing lists it too!) Dark blue with the magazine's name in gold, smart, sturdy and sensible - the mags are held in by strong aluminium rings, and we also have the kind of binder that has metal rods for the purpose. And compare our price with what other magazines charge you for binders!

VICWEAR

Ah, happy memories... our popular collection of good-quality Vic Computing tee-shirts and sweatshirts, all with the characteristic 'Vic Computing' logo. A choice of four witty slogans or the 'Vic Computing' banner will laze. Tee-shirts in grey, blue or grey/sweatshirts in grey. State colour and size when ordering - we have small, medium, large and extra large. We are running low on stocks, though - check the chart on the Order Form for availability.

T-shirt
£3.40
Sweatshirt
£7.00

better programs.

We've commissioned two special add-ons for the 64 from Whitty Computers, another company whose products we reviewed and liked. Just look what you get.

DAVID'S BASIC ...for better programs

Ways with numbers
AVG averages elements in an array of numbers
SUM sums elements in an array
MINI finds the smallest number in an array
MAX finds the largest

Ways with strings
PDSI is a string with spaces
BIANK sorts string into blank or non-blank characters
SEARCH searches array for given string or letter
SORT sorts arrays
SPCS gives string alpha-numeric number of spaces

Coping with keys
BRKAK catches the RUN/STOP and F1-F10 keys
DISKALT sets RUN/STOP
NGBI reads block of specified keys

Extra goodies
CHNTR traps error
ERROR sets trap program errors, lets you branch to an error-handling routine

Cleverer programming
CPR finds and lists
CI finds conditional END
LIFE ELSE
LIFE ELSE
POP removes 1 bit subrouter from stack - garbage collection avoids out-of-memory errors
PUSH puts a subrouter return address on stack - simulator COTO EXEC but like PROC releases it
SUBROUTINE - re-routes a previously specified thing to a basic statement
GTO GOTO a line with a B/M follow-up label
CALL calls for a GOTO
ROUT sets for DIFIN but allows you to do line multiple line routines

**PER performs all the basic to 64-bit
ON on data in array
COSM quick and easy
and subsequent
SCAN scans array for your
SWAP swaps array
MINING mining
SHRS compresses a number
into a string
RESTORE restores a number
used to STORE a string
number**

Deliberate displays
CLOC clock monitor system
COLS simplifies array
CURSOR puts cursor on
SPRIN prints a postcard
DWARD loads window
SWIND shows window
DISP displays center message

Basic input
DATES sorts date
CONVERT converts date
DATIN formatted date
GAIN input
CHC input agent
NUMIN assigned number input

Perfect printing
PRINTS, reformatting and
printing of report
PRINTS and header
SCOP screen copy
PCTB printer control - sets
number and line
on demand that lets you handle
gifs in M printer from
OUTB sets a buffer
printer for plotting

PRICE: £27.50

PRICE: £27.50

MATCHING COVER FOR ANY COMMODORE CASSETTE UNIT

£2.00

Keep your cassette clean too, with a matching black cover - effective, efficient.

Compare our prices. How can we do them so cheaply? And we're not compromising on quality either - these are some of the best covers we've seen!



**VIC:
ALL YOU
NEED TO
KNOW**
**VIC 20 User Guide by John
Heilborn and Ran Talbott,
published by McGraw-Hill.**

There are dozens of books about the Vic. But this one is the best all-rounder we've come across. Not cheap, maybe, but you get a lovely large-format paperback of 387 pages, packed with information and beautifully presented with professional illustrations and clear listings.

Ideal for beginner and expert alike. Hand holding intro to the Vic, but also includes 'how to use' sections on disk and printer as well. Excellent on graphics and animation, on writing, on sound (eg, a good chunk on combining sound and animation).

£10.95

**A GAP ON YOUR WALL?
The Commodore User Poster**



£1.75

Remember our February cover, with the enigmatic name: Commodore Renaissance Man looking for the cause of his SYNTAX error?

Well, we produced a poster version of it - and we have a few left over to the first 150 lucky customers. Printed in stunning colour on glossy high-quality paper. A3 size (about 16.5 by 23 ins). Just the thing for your bedroom or clubroom computer room wall.

Amadores User tee-shirts and sweatshirts are in good-quality cotton, ideal for late nights in front of the computer or the beach at Torremolinos or the lounge bar at the Pig and Whistle. Cobalt blue, with the magazine's logo big and bold across the chest. State size when ordering: we have small, medium, large and extra large.

easier programming!

```

What everyone needs
AUTO = auto - for autoing
DELAYS = delay for dinner
DOT = dot - for dots
END = end - for the end

```

- `FILE` = a stream opened
- `count` = displays the number of elements
- `fclose` = to open from disk or
= eg. not necessary
- `fread` = ptr array including
= 1000000
- `fscanf` = reads of
= 1000000
- `fread` = reads of
= 1000000

Name for variables
 Clarity: how easy is it to read
 Units: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 1516, 1518, 1520, 1522, 1524, 1526, 1528, 1530, 1532, 1534, 1536, 1538, 1540, 1

[illegible]

MDMref: type machine code memory
 MDMref: index for display memory in
 MDMref: read and write memory
 MDMref: type; secure returns

US\$1.5 billion in 2008 and new
in 2009.

be previously we'll enter machine code.
FUNC defines functions from keys. The
 next dialog gives them useful default
 meanings anyhow, but they can be
 changed with the
RESIZE new user interface. **NEWS-**
 per gram
SHRINK removes rights and all
 other news by space
CURSOR sets the cursor at the
 top left or right position
KILL, see page 10, find commands

PRICE: £27.50 SPECIAL BARGAIN
OFFER: order the two at the same time
 and save a fiver – £50 for the pair!

Cut out those SAVE/LOAD errors!

Read/write errors from tape? Mucky keyboard? Grubby screen? Dirt on the tape heads can be infuriating, and who wants a filthy-looking computer?

The Complete Cleaning Kit

Here is the answer: — an all-purpose VHS tape cleaning kit. It contains

- head cleaner for the cassette deck
- a pack of special lint-free foam cloths to use with grease and dust
- acetone can of anti-static isopropyl screen wipes
- ten anti-static dust-repelling sticky sticks for those hard-to-get-at places (ears?) to use with.
- acetone can of safe, residue-free cleaning fluid for awkward bits of the tape deck

What excuse can you have now?



GET INSIDE THE 64

Commodore 64
- getting the
most from it
by Tim Onosko,
published by
Prentice-Hall.

£7.95



Terrific value for the beginner, especially at the price—303 large-format paperback pages, e from the ground up all-purpose manual/tutorial/reference for the 64 Cxcel and sensible, clear presentation well written. Appendices include substantial contributions from Butterfield on the 64's memory and excellent examples of sound and graphics.

If you want to have to use only one book to get on top of your 64, buy this one!

KEEP IT CLEAN

Order Form

The prices below include VAT and postage and packing—but within the UK and Eire only. European and International orders—please add the amounts given opposite to the prices below. Expect delivery in 28 days. Contact us if you haven't had your order within that time. All orders subject to availability.

	European	International
Sweatshirts	£1 00	£2 00
Tee-shirts	£1 00	£2 00
All tapes	£ 50	£1 50
Books	£1 50	£3 00
Covers	£ 50	£1 00
Binders	£2 00	£4 00

Write the number you require in the relevant boxes	T-SHIRTS												SWEAT-SHIRTS					
	White £3.40				Blue £3.40				Gray £3.40				Gray £7.00					
	S	M	L	XL	S	M	L	XL	S	M	L	XL	S	M	L	XL		
A. VIC COMPUTING																		
B. CAPTAIN KILOBYTE																		
C. VICTIM																		
D. POKE 36879																		
E. UNEXPANDED VIC																		
F. COMMODORE USER																		

VICWEAR TOTAL SWEATSHIRTS	no. <input type="checkbox"/> at £7.00	CLEANING KIT	no. <input type="checkbox"/> at £16.95
VICWEAR TOTAL TEE-SHIRTS	: no. <input type="checkbox"/> at £3.40	OSIRISAN ASSEMBLER	VIC TAPE no. <input type="checkbox"/> at £17.95
COMMODORE USER TOTAL SWEATSHIRTS	no. <input type="checkbox"/> at £7.75		VIC DISK no. <input type="checkbox"/> at £19.95
COMMODORE USER TOTAL TEE-SHIRTS	no. <input type="checkbox"/> at £3.75		64 TAPE no. <input type="checkbox"/> at £17.95
VICTAPE ONE	no. <input type="checkbox"/> at £5.00		64 DISK no. <input type="checkbox"/> at £19.95
VICTAPE TWO	no. <input type="checkbox"/> at £5.00	THE COMMODORE USER TOOLKIT CARTRIDGE	no. <input type="checkbox"/> at £27.50
VIC USER GUIDE	no. <input type="checkbox"/> at £10.95	DAVID'S BASIC CARTRIDGE	no. <input type="checkbox"/> at £27.50
64 GETTING THE MOST FROM IT	no. <input type="checkbox"/> at £7.95	TOOLKIT AND DAVID'S BASIC	: no. <input type="checkbox"/> at £50.00
COMPUTER DUSTCOVERS	no. <input type="checkbox"/> at £2.50	GRAPHICS AID PACK	no. <input type="checkbox"/> at £4.20
CASSETTE DUSTCOVERS	no. <input type="checkbox"/> at £2.00	BINDERS	no. <input type="checkbox"/> at £3.99
COMMODORE USER POSTER	: no. <input type="checkbox"/> at £1.75	INFOTAPE CASSETTE	no. <input type="checkbox"/> at £9.95
VIDEO SPLITTER	no. <input type="checkbox"/> at £1.75		
GRAND TOTAL £			

NAME	<p>THIS IS YOUR DELIVERY LABEL - PLEASE PRINT CAREFULLY</p> <p>TOTAL ENCLOSED.</p> <p>cheques or postal orders should be made payable to COMMODORE USER. Or use Access</p> <p>Access card no</p> <p>Date Signature</p>
ADDRESS	

AQUANAUT

AN UNDERWATER EXPERIENCE
YOU WON'T BELIEVE

FROM
**INTERCEPTOR
SOFTWARE**

WRITTEN BY IAN GRAY
PRODUCED BY RICHARD PAUL JONES
MUSIC BY CHRIS COX

ONLY
£7.00
ON CASSETTE
£9.00
ON DISK

SUITABLE FOR THE
commodore 64

**INTERCEPTOR
MICRO'S**

LINCOLN HOUSE, THE GREEN, TADLEY, HAMPSHIRE

TEL (07356) 71145

AVAILABLE NOW
FROM
ALL GOOD COMPUTER
RETAILERS

Available for
TANDY COLOUR 16K
COMMODORE 64 ATARI 16K
DRAGON 32

PENGON

Can you save penguin
Willy from the ferocious mutant
sea lions? Stun them by knocking them against
the walls, or crush them to a horrifying death with
sliding ice blocks. High speed
arcade action game. Full
colour graphics. Music.
One joystick required.

CASSETTE £8
DISK £9.95



Mail Order Sales from
Microdeal Mail Order 41 Truro Rd,
St. Austell Cornwall PL25 5JE

Credit Card Sales   
Phone 0726 3456

Dealers Contact

MICRODEAL DISTRIBUTION
0726-3456
or **WEBSTERS SOFTWARE**
0483 62222

MICRODEAL

Selected Microdeal Titles available from computer dealers nationwide or from larger branches of



James

The 64 ought to be an excellent computer for games – and fortunately some suppliers are indeed taking advantage of that. Others aren't. Here's this month's crop of reviews.

How do we assess games? Basically we play them – which may sound obvious, except that all the reviewers have seen so many games that they can apply a bit of comparative experience to the evaluation.

We rate games out of five for each of four criteria. **Presentation** means how well the thing is packaged and how good it looks on the screen: dull graphics and poor sound get marked down here. **Skill level** refers to how much skill (of whatever kind) is required to play the game – so if pure chance is involved, the game gets a low mark. (But don't dismiss it on that: some 'chance' games are great fun.) **Interest** is an answer to how well the game did at maintaining the reviewer's interest in it. And **Value for Money** is obvious enough: it's our overall conclusion about how it compares with other games and whether we'd buy it ourselves.

AAARCHE! CONDOR

Joystick only
Price £7.95

The scene presented in this graphical game is that of a mountain landscape with a damsel laying helpless, having fallen down the mountainside. A strange valtre-like bird is swooping down to save her and carry her off – the question is can George, the local hero, save her? That of course depends on how good you are at controlling George's actions with the joystick.

To save the damsel, George has to climb the mountain, avoiding arrows shot by the local warriors, and deadly creatures and eggs carefully aimed at him by the vulgure. Once at the top of the mountain, George must seize the conveniently placed spear and hurl it accurately at the giant bird – but he must be accurate as there is little time to spare (space!).

The main criticism is that only a single scene is provided compared with the many multi-framed graphic adventures now available. Nevertheless, the graphics and sound for this single scene are very good.

PR/WG

Games Machine

Presentation: ■■■■

Skill level: ■■■■

Interest: ■■■■

Value for money: ■■■■

BONKA

Joystick only
Price £5.95

This is the first version of *Panic* for the 64 that I have seen; doubtless others will follow. Our hero has five floors to patrol in his quest of enticing the meaneuse into the cunningly prepared trap. To start the fun and games the all-important hammer seeds to be collected from the top floor with only one mouse to avoid that shouldn't prove an unmanageable task. Each time a mouse is recorded, the meaneuse return with another added to their

J. MORRISON FOR COMMODORE 64 MICROS Bonka



race track. The other racers behave like stock cars by attempting to barge you off the course – it's tough out there! You can reciprocate and also boost up your score.

One ace up your sleeve is the ability to leap into the air to escape danger, but this manoeuvre is only possible at speeds of 100mph plus; and approaching the water jumps that course of action is obligatory. There are four seasons to race through, marked by different colours for the course, and a choice of 20 different tracks.

A title-screen theme tune coupled with good sound effects, along with the ability to develop a

main adversary is now composed of rotating segments and the spider becomes a fireball. Missiles and mother ships also demand your attention.

In essence that program is virtually the same as *Comix Split* but with more graphical variations. Even for a newish machine like the 64 there are an awful lot of centepeds in need of extermination.

On the whole, a worthy attempt at diversifying a familiar theme with all the usual problems still facing the player.

LS

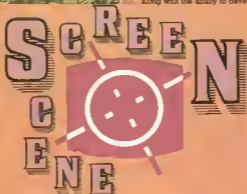
Rabbit

Presentation: ■■■■

Skill level: ■■■■

Interest: ■■■■

Value for money: ■■■■



rank (to a maximum of six) if you bodge up the execution process they naturally leap from the hole flashing with anger.

Large-size graphics and ball of fame are plus features; and if you're interested the screen is pink.

LS

J. Morrison (Micros)

Presentation: ■■■■

Skill level: ■■■■

Interest: ■■■■

Value for money: ■■■■

BUMPING BUGGIES

Joystick only
Price £6.99

The player, controlling a red car, is presented with a bird's-eye view of

dash hand throughout some complex circuits with the sense of 'going somewhere', mark this as one of the better games.

LS

Bubble Bus

Presentation: ■■■■

Skill level: ■■■■

Interest: ■■■■

Value for money: ■■■■

CENTROPODS

Joystick only
Price £5.99

This is Centepede green's spicy flavour by modifying the sound and transmitting hoosily creepy-crawlies into galactic beings. The



CONFLICT

Joystick or Keyboard
Price £14.75

Many of the comments made about *Galaxy Conflict* apply equally well to *Conflict*. Both are board-based strategy games in which you have to manage all the resources associated with making war. But there the similarity ends. Martech has managed to produce two games on the same principle that feel very different.

In *Conflict*, instead of having your resources automatically increased by the computer each round, you either have to trade

plunder on mine your cash. Arrows can only be raised if you have the funds. This sounds like a morally healthy idea. If the game takes off it could teach a whole generation in a painless way that war costs too much.

The board is divided into rows and columns (from A to Z and from 1 to 50). More than half of it is sea. The rest is split into two territories you can enter play an endgame where you try to invade the enemy city, or you can opt for more limited warfare and try to occupy the largest amount of territory after an agreed number of moves.

Revenue is raised through share dealing through forays to capture neutral shipping and through prospecting for oil. The stock market values go up when the shares are bought and down when they are sold - the computer works out the relative changes in value. Oil can be found on a randomly located series of squares in each territory. Ships at sea are blown about according to the weather.

The game has enough variables affecting decision making to keep the most ardent empire-builder scratching his/her head well into the night.

TH

Match Games

Presentation: ****
Skill level: ****
Interest: ****
Value for money: ****

THOMSON MICROSYSTEMS
MICROS Cybermen



CYBERMEN
Joystick only
Price £8.95

Of Beserk/Amok provenance, this one may well make its Yorkshire-based supplier some brass. You direct the utopian hero through a maze of corridors with the screen sliding from one area to the next

twice, come out of a trap, while war him. For the platinum bits scattered throughout the space station.

Robots guard each room, but these can be shot, not so the over-seer, who can also pass through walls. The only method of escape here is going into the next room by memorising not to trigger in the doorway for fear of electrocution. Apart from avoiding bullets it's a big no-no to touch the walls. As you progress, extra rooms will greet you through every portal. Cybermen also features a Hall of Fame.

Nice game.

LS

THOMSON (MICROS)

Presentation: ****
Skill level: ****
Interest: ****
Value for money: ****



CYCLONS
Joystick only
Price £9.99

The music from Star Wars promises this to be a space battle, but it's a contest with a difference.

Your spinning green fighter craft needs continuous monitoring to prevent it bouncing aimlessly around the screen, and (if selected from the menu) on to the jagged rocks too. The joystick controls not only direction but also velocity and I found constant adjustments to be necessary. From two to four whirling enemy aliens will engage you, plus one rotating purple saucer, according to difficulty level. Laser bolts may be normal or rocket, so in all there are several options of play. Collisions between enemy ships can be arranged, arranged cascades of white debris to the screen.

Overall the graphics and sound

effects are adequate, our only snag. Enjoyable game, though.

Nabb

Presentation: ****
Skill level: ****
Interest: ****
Value for money: ****

DAMSEL IN DISTRESS
Keyboard only
Price £7.95

This graphical game of skill is set in a medieval surroundings. Weakened by poison your knight must leap up and down various levels of the castle to rescue the princess, who conveniently holds the antidote.

On the way he'll have to jump over ghosts and menacing spiders, and he must collect scutes which are used to build a bridge across to the princess.

There are many versions of these graphical games on the market now, but this is not one of the best. Colours and sound are good but movement is slow and jerky. Although also appears to have a new screen to joystick despite that suitability for this style of game, this one only works on the keyboard.

FRWG

Alphata Software

Presentation: ***
Skill level: ***
Interest: ***
Value for money: ***

DICK'S DIAMONDS
Joystick or keyboard
Price £9.99

This game is highly original and totally addictive example. Arcade action at its best, making good use of the colour and graphics capability of the 64.

Dicky (the owl) has had to hoard of diamonds stolen by Stephen the spider, who guards one of them at the centre of his web. To recover it you manoeuvre Dicky over the web strands (win him turns black) until all the strands have been weakened and the web explodes. To make life much more difficult the last strand to be weakened must be the central one - otherwise you lose a life. Throughout the game Stephen attacks Dicky and also attempts to re-



turn the web. You can also get lost in a maze of web strands - here Stephen is a little profit, what is he up to? The web is a maze of strands, and the spider is a little profit, what is he up to?

None of it is a bad game, provided you have a good joystick. The game is a little more difficult and both of play and starting level. See table for more details. Stephen's third game, game position, is a little more difficult. However, it's a good game, but not a very good one. The highest score is 100,000 and the highest score is 100,000. The highest score is 100,000.

Highly recommended. Excellent value for money.

Romik Software

Presentation: ****
Skill level: ****
Interest: ****
Value for money: ****

3D TANX
Joystick or keyboard
Price £9.99

The first 3D game on the market, it's a good one.

You can play it on the 64, but it's a little more difficult.

It's a good game, but not a very good one.

It's a good game, but not a very good one.

It's a good game, but not a very good one.

It's a good game, but not a very good one.

It's a good game, but not a very good one.

It's a good game, but not a very good one.


It's a good game, but not a very good one.

It's a good game, but not a very good one.

It's a good game, but not a very good one.

It's a good game, but not a very good one.

It's a good game, but not a very good one.



Fly the world's deadliest mission!

BLACK HAWK

Black Hawk is the world's deadliest aircraft, but this is the world's deadliest mission...

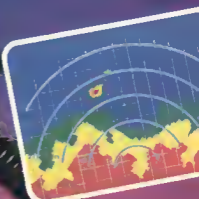
A vast number of enemy forces and a sizeable group of islands are under enemy control.

Your target is the enemy's main airfield, heavily defended by missiles, gunships and anti-aircraft guns.

Although the speed and firepower of Black Hawk are unmatched, they alone cannot help you win through. On such a mission, strategic skill is the ultimate weapon.

Your on-board computer, with its dual attack and defence screens, will assist you in increasing your strategic loss factor (S.L.F.) and achieving the mission objective. You also have an 8 page scenario tip guide you through more than 30 missions.

Black Hawk is one of the most advanced games of action and strategy ever written for the Commodore 64. You will find it in all major software retailers.



FOR COMMODORE 64

£7.95

CREATIVE SPARKS

“robustness and reliability were excellent... a really good feel to the action... a pleasure to use... not one game failed to load... nice professional... I like it... very impressed”

EXTRACTS: J.D. COLLINS
GIANT TEST VICCOMPUTING
(Vol. 2 Issue 5 June, '83)

DON'T JUST TAKE OUR WORD FOR IT!

SUMLOCK MICROWARE

SUPERB SOFTWARE FOR THE VIC 20



SP 01 SKINHEAD
Destroy the enemy
bustards from mid
missiles in their under
ground pits. Joystick
or keyboard.
M code £7.95



SP 02 JUMPIN JACK
Cross a busy road and
breathe in their toxic
gas. Joystick or
keyboard. Multi-colour
M code £7.95



SP 03 TRIAD
Defend your base against the
sudden raids of alien
battleships. Joystick
or keyboard.
M code £7.95



SP 04 STRIAD
Defend your base against the
sudden raids of alien
battleships. Joystick
or keyboard.
M code £7.95



**SP 05 ASTRO
FIGHTERS** A space war
played by two players
at once. Joystick
or keyboard.
M code £6.95



SP 06 CHOPPIN
Attack and destroy the
enemy base but watch
out for ground
mines. Joystick or
keyboard.
M code £6.95



SP 04 CHOPPIN Your aim has been
ground on a grid of high-tech alien
bases. Destroy them before
they can destroy you. Use the
multi-colour screen to see
your progress. Joystick or
keyboard. M code £7.95



SP 05 MULTITHRON Learning
resumes
the excitement when moving your
base. Joystick or keyboard. M code
£7.95



SP 06 DESTROYER
Battering river Sea Air
batteries with the
destroyer M code
Victory Joystick or
keyboard. M code
£7.95



SP 07 GUN FIGHT Does
with a deadly machine
in a water in shoot
the computer or
two player. Joystick
or keyboard.
M code £6.95



SP 08 SPACE RESCUE
Pack your rescue unit
through the asteroid
belt to save the
stranded crew. Joystick
or keyboard.
M code £6.95



**SP 09 STARSHIP
ESCAPE** A computer
and handling time
game. Space
adventure. Joystick
or keyboard.
M code £6.95

... AND THE COMMONORE 64

SP 01 SKINHEAD Destroy
the enemy bustards from
mid missiles in their
underground pits. Joystick
or keyboard. M code
£7.95

SP 02 JUMPIN JACK Cross
a busy road and breathe
in their toxic gas. Joystick
or keyboard. Multi-colour
M code £7.95

SP 03 TRIAD Defend your
base against the sudden
raids of alien battleships.
Joystick or keyboard.
M code £7.95

SP 04 STRIAD Defend your
base against the sudden
raids of alien battleships.
Joystick or keyboard.
M code £7.95

SP 05 ASTRO FIGHTERS A
space war played by two
players at once. Joystick
or keyboard. M code
£6.95

SP 06 CHOPPIN Attack and
destroy the enemy base
but watch out for ground
mines. Joystick or
keyboard. M code
£6.95

SP 07 GUN FIGHT Does
with a deadly machine
in a water in shoot the
computer or two player.
Joystick or keyboard.
M code £6.95

SP 08 SPACE RESCUE
Pack your rescue unit
through the asteroid belt
to save the stranded crew.
Joystick or keyboard.
M code £6.95

SP 09 STARSHIP ESCAPE
A computer and handling
time game. Space
adventure. Joystick or
keyboard. M code
£6.95

SP 10 DATA PACK
A companion of an
exciting puzzle game.
Joystick or keyboard.
M code £6.95

SP 11 DATA PACK
A companion of an
exciting puzzle game.
Joystick or keyboard.
M code £6.95

SP 12 DATA PACK
A companion of an
exciting puzzle game.
Joystick or keyboard.
M code £6.95

SUMLOCK MICROWARE

198 Deansgate, Manchester, M3 3NE.

061 834 4233

AVAILABLE FROM GOOD COMPUTER DEALERS AND BOOK SHOPS NATIONWIDE INCLUDING: WILKINS, SHERRAT & HUGHES, JOHN MENZIES, OVERSEAS EXPORT ORDERS DM APPLICATION. ALL SOFTWARE IS FULLY GUARANTEED. PRICES INCLUDE POSTAGE & PACKING

PLEASE SEND ME THE FOLLOWING MICROWARE (QUOTE NO.)

TO NAME ADDRESS

ENCLOSE CHEQUE/PO £

DPY NO VEST

SCREEN LINE



Two missions is to watch the American Embassy and if a terrorist passes the window you shoot at him. Kill enough and you get promoted to shoot a hostage, and demonism accomodate.

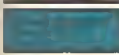
This is a simple reaction game where you move a cross-hair sight over windows and shoot. Terrorists appear in shirts of one certain colour - so don't shoot any other colour! But what makes life harder is that they change colour now and again and your best target suddenly becomes a hostage.

Every six shots you must move your gun sight to the armoury and fire at it to reload. This is usually when all the best targets appear (it's as logical to shoot an armoury I suppose as it is to bomb fuel dumps). Scramble! .j

As a subject for a game the morality is a little shaky. But leaving that aside, I also found it becoming tedious after a while. The only variety is in the shut colour changing and the overall speeding up as you get more points. **DB**

Viktronics

Presentation:	****
Skill level:	***
Interest:	***
Value for money:	***



Bubble Bus features communised music in this game and I would suggest that the graphics are noteworthy too but the action is less interesting.

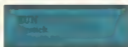
A gamekeeper, armed with a shotgun, is protecting his hutchbacks from hovering eagles in a setting akin to a landscape painting. It's a matter of downing the birds before or after they steal the fish, there's a choice of two methods of shooting, according to difficulty level. Once free of your changes have been lost the game is over - although bonus sticks are awarded every 5,000 points, announced by a flourish of ducks.

Eight levels of skill, a high-score table and competent sound effects rot enough variation of play, how-

ever. That all makes this a game directed at the juniors. **LS**

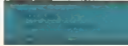
Bubble Bus

Presentation:	****
Skill level:	****
Interest:	****
Value for money:	****



Another example of a well-known pub arcade game being adapted for the C64. In this case the capabilities of the machine have been used to maximum effect, resulting in an excellent game.

You control Quasimodo (the hunchback) who has to leap along the castle ramparts to rescue Esmeralda, imprisoned in the castle stronghold. To reach the princess Quasimodo must negotiate 15 screens of fun and excitement.



Here we look at two packages that approach the problem of putting the social clubbers game on the screen in two very different ways. Handic's package allows considerable scope; and Bridgemanster aims to teach the game as well as provide hands against which you can practice.

To start with we're not convinced that the Bridgemanster approach is the best way to learn the game. Bridgemanster is certainly a good stab at trying, however the introductory book (included with the two commentary tapes) is well laid out and the tapes are excellent.

Presentation on screen takes the form of so many written interpretations, hands are numbered North, West, East and South, beginning with 'hands' and no bidding sequence.

The program takes you through the essentials of bidding, to the complex routines of conventional bidding.

We certainly found it all well-presented and informative, but one small gripe was that the only correct card (or bid) could be played - all other entries were invalid. This actually omits the possibility of learning by one's mistakes, and winning all the time can get boring.

Handic's cardmug, on the other hand, allows you to play any card you wish and therefore provides a computer opponent rather than a learning package. The presentation of Handic's seems basic, though, and there's no grading from easy to difficult hands. One large criticism is the lack of any bidding sequence - the bid is merely called and not reply given. This tends to degenerate the game to a form of wit with a bridge format.

If you're a beginner, the Bridgemanster package certainly comes up trumps (sic) because of the unrelenting hands to play. Handic's is one for the more experienced. Having said that we still learnt a lot from Bridgemanster and overall we preferred that package. **RR**

Handic

Bridge Master

Presentation:	****
Skill level:	****
Interest:	****
Value for money:	****

Presentation:	****
Skill level:	****
Interest:	****
Value for money:	****

Flying Feathers

COMMODORE 64 bubble bus software



each one more difficult than the last. These include swinging on a rope over a fiery pit, dodging arrows and fireballs whilst leaping over trenches containing knights with sharp prodding pikes (oooh! that smarts!) and finally, don't forget THE BELLS!

Animation and graphics are superb all the family will thoroughly enjoy hunchback. **PR/WG**
Ocean Software

Presentation:	****
Skill level:	****
Interest:	****
Value for money:	****



A lengthy load time is repaid by a superb example of the City Defense genre. As soon as you're

ready to go, take a last look at the pristine, multi-hued space city you're about to defend. Uttermost different saucers and UFOs (I lost count) will make kamikaze runs at the metropolis at your charge. Each variety employs different tactics, and they may well try to ram you. There are 24 waves in total and only megaplayers will see them all - unless you cheat and preselect them. Your craft, once moved, is continuously in motion vertically or horizontally and it's quite an art to make an interception while avoiding collision with the alien - not to mention the screen boundaries. Fortunately your laser is of the rapid fire variety you certainly need! Success generates glorious explosions to the accompaniment of it's-all-happening sounds. Some of the variants will slip past your defensive efforts and smash chunks from your rear estate; the game finishes, of course, when the city is no more or your laser succumbs.

Really good graphics, superb animation - sprites coming out of their own, and all very colourful. The screen is utterly continuous, indeed the only response is between attack waves, with a fair degree of skill needed.

Could that program be the reason you bought your 64? Certainly one of the best space games I've seen. **LS**

PSS

Presentation:	****
Skill level:	****
Interest:	****
Value for money:	****



Nightmare Park presents the player with a rudimentary maze and the object is to emerge from the exit (something like Hampton Court). At frequent intervals during negotiation of the maze the computer presents you with problems which must be overcome for you to survive. Some of these involve brain power, such as mental arithmetic questions, others require manual dexterity such as manoeuvring your character around a herd of stampeding unicorns. Finally, some of the problems involve pure chance, such as guessing which of three doors does not conceal a hungry lion!

The skill level is selectable and there are a wide variety of problems to solve. But graphics, animation and sound are not very impres-

erve, and the game is only likely to appeal to the younger punter who is usually less daunted by this more elementary form of games programming.

WG/PB

AR Software

Presentation:	■■■■
Skill level:	■■■■
Interest:	■■■■
Value for money:	■■■■

NEPTUNE'S DAUGHTERS

Joystick
Price £7.95

Something novel for deep-sea divers. The graphics are superb. You control a diver armed with what looks like an underwater laser. The aim of the game is to swim your man through various grottoes, avoiding the very determined octopus that swims after you through screen after screen, until you come, eventually, to the sea serpent's lair.

The concept has a lot in common with the classic 'copper' arcade games where you try to fly through caves while avoiding the missiles. But the graphics and the obstacles are new enough to make this game an original.

The route through the underwater caverns is blocked in the early stages by sucking-like weeds. Repeated firing shrinks them and clears the way, but never forget the octopus. It returns again and again.

I never got to see even one of Neptune's daughters. My man kept getting caught in a no-exit cavern swarming with amoeba. These come at you from all sides and for those with normal reflexes, that's as far as you get.

Beyond this lies the monster crab which you need to feed to the sea serpent until it falls asleep and lets you free the maiden. Sounds like a fairy tale to me.

English Software Company

Presentation:	■■■■
Skill level:	■■■■
Interest:	■■■■
Value for money:	■■■■

PARATROOPERS

Joystick or keyboard
Price £5.99

With no much action that you may mistake it for a Lebanese ceasefire, this offering also has its graphical attractions definitely



made in Splinterman, its appeal is directed fairly and squarely at quick-shot hands.

After selecting the offensive/defensive options from the menu, the player finds an ack-ack gun warding off a massive armada of helicopters (with appropriate sounds) that are dropping paratroopers, complete with billowing parachutes, towards your bunker. Various bombing runs to add to the jollity. The whole scene is quite realistically depicted, the multitude of explosions enhance an already colourful scene.

Ack-ack shells can be played around to act up a defensive umbrella. But inevitably some commandos get through signalling a tank to enter and blast away your gun. And I found the whole animation most pleasing.

Rabbit Software

Presentation:	■■■■
Skill level:	■■■■
Interest:	■■■■
Value for money:	■■■■



TROOPA TRUCK

Joystick or keyboard
Price £5.99

An exhilarating dollop of fun which all my family enjoyed. Four sep-

arate coloured tiers of scenery scroll at different rates to provide an illusion of moving in an arid, spacious environment; a fitting tune (turned off if you must) accompanies your buggy on its perilous journey.

It's not unlike Skramble on terra firma... except that the terra is not too firm! Craters the bumps (as in Skramble there seems no logic in this).

The usual format does present some orientation problems at first but this is soon overcome. After a given duration on this track you are switched to a dogfight screen, then back to the course again. After several such encounters, with different aliens each time, you get to meet the final obstacles.

Five skill levels and a demo mode (great for reviewers) are provided. It is certainly different and features unusual graphics. But to my mind the play is too disjointed; on the other hand, my youngster loved it.

Big G

Presentation:	■■■■
Skill level:	■■■■
Interest:	■■■■
Value for money:	■■■■



THE QUEST OF MERRAVID	
CBM64 (or Vic 20)	
Unexpanded	
Keyboard only	
Price £7.95	

No prizes for guessing from the title that this is an adventure game. A novel feature though is that the single cassette has a version for the CBM 64 on one side and the Vic (+16K) on the other. If this feature were more generally adopted it would make eventual upgrading of

the Vic-30 to a CBM 64 more attractive.

This is a classic text-only adventure game in which instructions are provided in lower-case letters, with some use of colour. You are attempting to retrieve the magical firestone which was guarded by an evil dragon. Before you can engage the dragon in battle you must collect a complete set of armour, the various pieces being scattered throughout the land... and hence the adventure starts.

All the ingredients of the enjoyable adventure appear to be present. One criticism, however, there's no save-to-tape option so you must start afresh each time you come back to it.

WG/PB

Presentation:	■■■■
Skill level:	■■■■
Interest:	■■■■
Value for money:	■■■■

ZAPPY ZOOKS	
Joystick only	
Price £6.99	

Yet another dot-gobbling game with very little attempt to hide its Pacman origins. The joystick is used to guide Whirly along the space corridors collecting 'alpha particles' and avoiding the Zooks. If Whirly collects a power dress plug, the Zooks are temporarily drained of energy and in this state Whirly can catch them.

The graphics are good but not outstanding, and the movement through the maze is a little awkward. Two movement options - continuous or touch mode - are however provided, so that when you release the joystick Whirly continues in the direction you last commanded (continuous) or he stops moving (touch). Also selectable is the number of Zooks (from one to six).

The action starts off slowly but speeds up as you clear frames and move up a level - 14 different levels are provided. A final feature is a practical mode in which you can pre-select the higher levels to practice at the faster speeds.

In conclusion - no marks for originality but not a bad version of an arcade classic.

WG/PB

Presentation:	■■■■
Skill level:	■■■■
Interest:	■■■■
Value for money:	■■■■

Romik Software

HEARD THE NEWS?
MICROPOWER ARE ON
THEIR WAY WITH
COMMODORE 64
SOFTWARE!



DUCKWORTH HOME COMPUTING

All books written by Peter Gerrard, former editor of *Commodore Computing International*, author of two top-selling adventure games for the Commodore 64, or by Kevin Bergin. Both are regular contributors to *Personal Computer News*, *Which Micro?* and *Software Review*.

SPRITES & SOUND ON THE COMMODORE 64 by Peter Gerrard

A complete guide to using the extraordinary features of the Commodore 64 together with a full working explanation of the chips that make it possible: the 5581 Sound Interface Device and the 6566 Video Interface Chip, together with the processor that makes it all tick, the 6510.

Sections on programming your own musical instruments, producing original and programmable character animation, make this the guide for users of the Commodore 64 who want to get the most from the special features of their computer.

£6.95

COMMODORE 64 GAMES by Kevin Bergin

This is a collection of 21 exciting programs specially written for the Commodore 64, including *Golf*, *Snake*, *Air Attack*, *Drugs*, *Car Dodge*, *Tank Battle*, and *Manfield*. An adventure game is also included as well as a program to enable you to devise your own version of Basic by re-defining keywords. Each program is accompanied by notes on its structure to enable you to modify or extend it.

£6.95

Other titles in the series include *Using the 64*, *12 Simple Electronic Projects for the VIC*, *Will You Still Love Me When I'm 64*, *Advanced Basic & Machine Code Programming on the VIC* and *Advanced Basic & Machine Code Programming on the 64*.

Write in for a descriptive leaflet (with details of cassettes).



DUCKWORTH

The Old Piano Factory, 43 Gloucester Crescent, London NW1 1DY
Tel. 01-485 3484

THE FABULOUS CASSETTE

the Cassette 50 tape
you've been waiting for
C commodore 64
50 GAMES ON ONE CASSETTE

A Cassette 50 is also
available for VIC 20.

Now
Available

50
ONLY
£9.95
(INC. P&P and VAT)

Games available on the
Commodore 64
Cassette 50

All games can be played on
Keyboard but many are Joystick
compatible which adds up to
hundreds of K of game software on
one cassette.

We will buy any quality games and
better anyone's price and royalties
Machine code or basic, you've got
nothing to lose and everything to
gain. Send now for a free
evaluation, all games will be
returned if you choose not to accept
our offer.

MAZE LATER
QUICK ATTACK
SPACE MISSION
LUNAR LANDING
BASIC LANDING
ATTACK
BASIC BOG
FIGHT
PICK ATTACK
WAVE ACTION

PLASMA BOLT
QUICK ATTACK
NOVAHITS
AND
CROSSERS
BOOTS
FINGER
SERI JUMP
NANAMAN
OLD TONES WAR

THIN ICE
DRITTER
WOLFSWAY
FORCE FIELD
OVERCAST
KING TANGIT

SHARK THE
WINDERS
SPACE SHIP
JET FIGHT
PHASER
INTRUDER

INFANT
SHOOTER
SUBMARINE
SMALL SEARCH
PLANETS
BLACK HOLE

DYNAMITE
DO YOUR DUMB
PARACHUTE
GARY GARY
JET MOTOR
UNIVERSAL
RAVE

TAMBO
PARACHUTE
JET MOTOR
THE TONG
TAMBO

EXPRESS DELIVERY ORDER NOW

Name _____

Address _____

Post Code _____

Country _____

Dealers & Stockists enquiries welcome

Please send me by return of post, Cassette 50 at £9.95
per tape. I enclose a cheque/journal order for

£ _____ made payable to _____
Cascade Games Ltd

Please debit my ☐ No ☐

COMMODORE 64 ☐

VIC 20 ☒

Cascade Games Ltd,
Suite 4, 7-3 Haywards Crescent, Harrogate,
North Yorkshire, HG1 5BB England
Telephone: (0454) 804518

CU 8/84

cascade

A Real-Time clock for the 64

by David Bolton

It's a little known fact that the 64 contains not just one but two real-time clocks - in addition to the 'software' clock using 71 and 715. This information about the clocks is in the Programmer's Reference Guide; but unless you are into reading technical appendices you wouldn't find that out. David Bolton reveals all...

The 64 has two I/O chips known as 8596s. These are manufactured by MOS Technology, a company that is owned by Commodore, and they are upgrades for the well-known 6522 (the so-called 'Versatile Interface Adaptor', or VIAs for short). The 8596 is known as a Complex Interface Adaptor (or CIA), but I think it's called a CIA because it's a chip with intelligence (Omnipotent Ed).

Four registers in each chip control the clock times. These are registers 85, 10 and 11, and they're at the addresses shown in the table.

Setting and reading the clock

The last two columns need some explaining. Because the clock is driven by hardware, it functions independently of the 6510 processor. This means that it can change while being read or set. Even though the processor can do about 30,000 instructions in a tenth of a second, Murphy's Law would still probably cause the clock to be changing just as it was being read or set.

To show that consider the time as being 9:59:59 when the clock is read. There are four registers which must be read separately. If the hours element was read first, the seconds and minutes might change, and so the time would be 9:00:00. If seconds were read first, it might be read as 10:59:59

(The program given later takes care of all that.)

The second problem arises because MOS Technology made the real-time clock easier to use from machine code. The clock employs a system called Binary Coded Decimal (BCD) instead of binary. Instead of storing the time as an absolute time, say '47' seconds, the value is stored as two decimal digits - 4 and 7. The true value is obtained by multiplying the left-hand digit by 10 and adding the right.

So 47 seconds is represented as $4 \times 10 + 7$, which is 47. This may seem like an odd way to do things, but it's because the processor would have to divide by 10 to get the left-hand digit back (when displaying 47). If it were actually stored as '47', in BCD it would only have to divide by 16, which is done by a mere four instructions: division by 10 is very awkward and takes much longer.

The last thing to note is that the top bit in register 11 says whether the time is AM (the bit is cleared) or PM (it is set).

The listing

The program here sets up a machine-code routine that will display the time on the screen at all times - unless you use the cassette (in which case the screen goes



Anyway MOS Technology thought of this when designing the chip. To set the clock, it must first be stopped and this is done when the hours value is written (or POKED) into RAM. The hours value is set and as soon as the 1 secs is written the clock restarts.

Reading the clock is similar except that the clock does not stop when the hours register is read (or POKED), instead, all the time registers become 'latched'. This is an electronics term which means that the clock registers freeze with their current time, but the clock keeps on running. As soon as the 0.1 secs register is read the registers are 'unlatched' and they take on the current time.

Other hassles

There are two other problems to be dealt with before we can get our clock going. The first arises because of the difference in means of frequency between the UK and the USA. In America, the main runs at 60Hz and in the UK it is 50Hz. All 84s sold over here are set up for 60Hz, so when the clock starts, it only goes 50 pulses per second. The main units sold in Europe are set up for 50Hz. And so it runs 10 seconds slow every minute.

Once again MOS comes to the rescue. The people there thought of this and built inside the chip a switch which can be set to either 50 or 60Hz. So when the frequency is 60 or 60Hz, the clock is used you must do this for Chip One.

POKE 56334, FREEK(56334) OR

128

And for Chip Two

POKE 56390, FREEK(56390) OR

128

Register	Chip 1	Chip 2	Function	Reading	Writing
6	56328	56584	0.1 secs	Unlatch	Start
9	56329	56585	seconds	—	—
10	56530	56586	minutes	—	—
11	56531	56587	AM/PM	Latch	Stop
			8 hours		

blasts anyone) or you press RUN. Check the lines of DATA carefully and SAVE it before you run it. If you get it wrong when keying in, though, the program will stop and red you.

When you first run the program, it will ask you to enter the time in the format 'A.P.H.MM.SS' - for instance 'A.06.10.47' for 6.10 and 40 seconds in the morning or 'P.11.30.00' for 11.30 at night. Don't forget the dots they are important.

When you enter the time, make it a few seconds in advance and press return about half a second before the time. Within a second the correct time will be displayed in the top right of the screen and it will be updated every second.

The Basic program does the conversion to BCD and POKES the registers in the correct order. Operators like dash or cassette read/writes use interrupts and will stop the display, but it will resume (at the right time) when they are finished. You can use cassette without any problems.

For the technically-minded, the machine does the BQ interrupts and re-displays the time once every second. It always displays it in the current printing colour (obtained from location 646).

One obvious use I have not discussed is the creation of an alarm clock. The CIA chips have but facility built in along with the real-time clock. You can set up an alarm time, and when the clock reaches this you will generate an interrupt which will generate a flash the screen or sound music. [I gave a program for that at a later date.]

```

10 T=0:FOR 1449152 TO 47538:READ A17=T+ATPOKE 1,41NEXT
15 IF T=14885 THEN PRINT "DATA WRONG":END
20 PRINT "CLR3:1C2D:ENTER TIME (A/P,H,M,S):"
30 INPUT A2:IF LEN(A2)=10 THEN 20
40 M2="A":IF LEFT$(A2,1)="P" THEN M2="P"
50 HR=1449VAL(MID$(A2,3,2))
60 IF H:0 AND H:13 THEN BEEP
70 IF M:0 AND M:60 THEN BEEP
80 IF S:0 AND S:60 THEN BEEP
90 SE=1450VAL(MID$(A2,6,2))
100 IF S:0 AND S:60 THEN SE=S
110 REM NOW CHANGE TO BCD
120 IF HR:0 THEN HR=HR+6
130 IF M:0 THEN M=M+INT(PN/10)+16*PN-INT(PN/10)*10
140 IF SE:0 THEN SE=SE-INT(SE/10)+16*SE-INT(SE/10)*10
150 REM NOW SET TIME
160 P=HR+P:THEN HR=HR+128
170 POKE 56331,HR
180 POKE 56332,M
190 POKE 56333,SE
200 REM START CLOCK
210 POKE 56328,0
220 REM START DISPLAYING IT
230 SYS 49152
240 END
500 DATA20,169,21,141,20,169,192,141,21
510 DATA3,173,14,220,9,128,141,14,220,88
520 DATA96,220,17,168,171,201,80,144,8,169
530 DATA101,162,133,169,139,212,101,168,123,170
540 DATA173,11,220,72,160,159,41,128,240,2
550 DATA164,144,152,160,0,145,167,52,129,192
560 DATA22,154,192,104,41,127,52,111,192,169
570 DATA186,145,167,32,128,192,173,10,220,32
580 DATA111,192,169,56,145,167,32,128,192,173
590 DATA169,52,111,192,173,8,220,76,49
600 DATA53,72,41,240,74,74,74,74,32,124
610 DATA172,104,41,15,105,176,85,167,173
620 DATA134,2,45,16,220,167,208,2,220,168
630 DATA20,169,208,2,220,170,8

```

Continued

WHAT?
MICROPOWER RELEASING
COMMODORE 64
SOFTWARE?
FANTASTIC!!!



CBM 64— VIC PRINTER

For only £79.90 fully inc!

"Very good - and good value too" Commodore User Review Dec 1983.
Probably the world's cheapest Vic/64 Printer, but better print quality
than printers three times the price! Put the superb ALPHACOM-32
Printer (or ZX-Printer) on your Vic/64 using the

SOFTX PRINTERFACE

Printerface alone only	£20.95 fully inc!
Alphacom system complete only	£75.90 fully inc!
Vic Wordprocessor package only	£5.95 fully inc!
(64 version T.B.A.)	

- * Alphacom-32 printer already established in W.E. Smiths, John
Moulton - 337 659 95
- * Prints in blue or black on economical white paper (costs 1.2p per
sheet)
- * Very robust and hardwearing! Gives consistent, high quality print
- * Silent but fast - up to 96 characters per second
- * Full Vic/64 graphics as well as user defined characters
- * 64 column printer with superb formatting facilities
- * Excellent high resolution graphics
- * 2-year warranty available, same as Commodore Vic/64 printer
- * Works on Sinclair's ZX-PRINTER (Needs ZX-power supply - £5.50
fully inc!)
- * Fast Delivery - friendly backup - simple to use!
- * Not a printer, but as fast, economic to run, dot matrix printers

Send orders/enquiries to. US

SOFTX
Computer Accessories

SOFTX COMPUTERS, 37 Wheatsell Rd,
Bournemouth BH7 6LH, Tel 0202 422285.

PROTECT YOUR CBM64 - VIC20



with a 'PROTEC' lid.

Made from tough plastic with attractive finish!

£8.50
+ (£1.25 p&p)

Also available:-

- R.O.M. Cartridge holders.
- C2N Cassette unit cover.

Name: _____

Address: _____

'PROTEC' (Tel: 0703-785682)
40 Laundry Road,
Shirley,
Southampton,
Hants SO1 6AN

Hi-res Pictures – using your joystick

By Albert van Aardt

Here is a little program that will allow you to draw pictures on the 64's screen in high resolution. You cannot print it (hopefully somebody out there will decide to write a hi-res print utility); but you can generate quite a few pictures.

lines 200 to 299 of the program provide the menu. Obviously you can change them, but watch out for line 295! You need that to set up the addresses for the hi-res screen.

Lines 230 to 250 ask for the X and Y co-ordinates to be used in starting the program. As the Commodore 64 has a resolution of 320 by 200 pixels, this is checked. Note that these co-ordinates will only be used for the first time thereafter the plotting will start at the point where was stopped.

lanes 300 to 330 set the 64 in hi-res mode. Lanes 400 to 430 clear the hi-res mode, because it will still be full of garbage from power-up (or it will contain whatever you've last put there - maybe some of Klingons or something).

Line 20 then reads address 58320 - that is the place where joystick 2 puts its information. Line 30 checks to see if the FIRE button has been pressed, and clears the screen if so.

Lines 80 to 130 figure out in which direction you've pushed the joystick, and line 140 calculates the point to be plotted. The actual plotting is done in line 150.

And that's it! The heart of the program is in 130 to 150, and the same coding can be used for any *tu-res* plotting program. By varying the value of X and Y, you can draw straight lines, curves, circles and the rest.

Type in the program as it is, and save it. Then NEW and re-enter 130 to 150, 300 to 420, and SAVE that. This is now a hi-res subroutine, and you can use it anytime you need hi-res plotting. Remember that subroutines 300-330 and 400-420 need to be run before you can use the plotting one.

Program 2 is an example `fu-res` program, using the lines mentioned above. You should be able to figure out what it does, it's really very simple.

```

10 GOSUB 200 GOSUB 310 WOSUB 400
20 REM GE1 DIPECTION
30 J2=PEEK(53205): F=J2*ND15: J2=15-(J2*ND15)
40 IF F<16 THEN GOSUB 400 WJ2=0
50 IF J2=50R J2=60R J2=4 THEN I=1: GOTO 6
60 IF J2=50R J2=60R J2=10 THEN I=1: GOTO 6
70 IF J2=10R J2=50R J2=3 THEN I=1: GOTO 6
80 IF J2=20R J2=60R J2=10 THEN I=1: GOTO 6
90 IF I=0 THEN I=ND15
100 IF I=0 THEN I=0
110 IF I=1 THEN I=ND15
120 IF I=1 THEN I=ND15
130 CH=INT(J2/8): K=INT(I/8)
140 L=ND15*ND15: B=BASE64*ND15+ND15*ND15: I=I+1: REM TO CALLUEN
150 POKE B, PEEK(B)+K: REM TO PLU
160 GOTO 20
170 REM INSTRUCTIONS
180 PRINT "JOYSTICK: I=ND15"
190 PRINT "START CO-ORDINATES: C=C*19: B=C*19"
225 PRINT "JOYSTICK IN FURT 2)"
230 INPUT "X=": X
240 INPUT "Y=": Y
250 IF X=19 THEN I=0
260 IF Y=19 THEN I=0
270 CH=INT(X/8): K=INT(Y/8)
280 PRINT "PRESS FIRE TO CLEAR SCREEN"
290 FOR I=1 TO 300 NEXT I
300 PRINT "GOOD LUCK!"
310 FOR I=1 TO 300 NEXT I
320 B=BASE64*ND15: POKE B, PEEK(B)+K: REM TO PLU
330 RETURN
340 REM SET TO HI-RES
350 POKE 53205, PEEK(53205)+R32
360 FOR I=1024 TO 2048 POKE I, 3: NEXT I
370 RETURN
400 REM CLEAR HI RES SCREEN
410 FOR I=BASE64*ND15+799 TO BASE64*ND15+800 NEXT I
420 RETURN

```

QUALITY IN COMPUTING

Robert Young and Roger Bush

Games featured include: Arcade action, Leaper, Fire, Skiing, Cosmic Journey Adventure and simulation: Survival Battle of Britain Challenge the computer: 3-D noughts and crosses, Statesman Appendix Writing your own games

CRAZY GAMES FOR YOUR COMMODORE 64

Tune up the muscles of your mind with this enthralling collection of arcade and action games, puzzles, brain teasers and competitions for your Commodore. In this book, you'll find 30 tested programs, each one supported by detailed instruction, full listing and an imaginative setting to create the scene.

Games featured include: Galactic monsters, Zombies in the swamp, Kentucky derby, Genies at work, Shakespearean shuffle, Adventure of the century. IT, The Swedish pop song: Las Vegas a go go, Parrott, Black box

May/192pp/illus/0 201 14675 4/paper/£3.95

Len Lyons and friends

This unique applications guide offers novice programmers an easy entry into the world of word processing, telecommunications, sound and graphics, spreadsheets, filing programs for Commodore BASIC. The authors provide step-by-step instructions for using some of the most popular software packages available in each area.

Contents include: What computing can mean to you; The computer system and how to use it; Computer applications and how to make them work for you.

August/256pp/illus/0 201 05156 7/paper/£10.50

Please order from your local bookshop
in case of difficulty, order direct from the publisher

Please send me the following books:

14428 Young and Bush	£6.95
14675 Renko and Edwards	£3.95
05154 Lyons	£10.50

Please add 50p for P+P
I enclose a cheque/postal order for £_____ OR
Please charge my Access/Visa/American Express/Diners Club
Account No. _____


[illegible]

Signed _____ Date _____

Name _____

Address _____

Dept C Addison-Wesley Publishers Ltd

 53 Bedford Square London WC1B 3DZ

Tel: 01-631 1636 COMM

I GOTTA KNOW!
WHEN ARE
MICROPOWER GONNA
RELEASE THEIR
COMMODORE 64
SOFTWARE?

Superbase 64

NUMERIC, CONSTANT, RESULT OR DATE. INFILES OF UP TO 364 CHARACTER(S).
SUPERBASE 64 EVEN HAS SPREADSHEET AND CALCULATOR CAPABILITY, CALENDAR
FUNCTIONS, EASY TRIP FROM MICROPROCESSOR/DATA BILLS, BOTH MENU-DRIVEN AND
PROGRAM OPTIONS, SORTING/SEARCHING, FULLY DEFINABLE OUTPUTS... SUPERBASE 64
IS ESSENTIAL IF YOU WANT THE BEST FROM YOUR 64! SUPPLIED ON CDM 1541 DISK
WITH EXCELLENT TUTORIAL/REFERENCE MANUAL. (C.R. PRICE \$49.95) (C.D.M.)

VIZAWRITE 64

ADVANTAGE OF THE 5.5 S COLOUR, GRAPHICS AND MEMORY FEATURES, AND SUPPORT VIRTUALLY ANY PRINTER! WITH A COMPREHENSIVE AND EASY-TO-FOU-0 USER MANUAL.

Master 64

MASTER HAS 85 NEW COMMANDS... AND BASIC IV TOO! PLUS PROGRAMMER'S TOOLKIT, MACHINE CODE MONITOR, BUSINESS BASIC, KEYED DISK ACCESS, MULTIPLE SCREENS, USER-DETERMINABLE INPUT ZONES, REPORT GENERATOR, 22-PLACE ARITHMETIC, DISK AND COMPRESSION, DATE CONTROL, SCREEN PLOT, SCREEN DUMP, AND MORE... EVERYTHING you need to do business with a MicroVax. Now call 1-800-368-0000, ext. 2111.

*** WANT IT 500000000 *** FALL IS TRSRY *** RM 00 544-755

[illegible]

PRICES INCLUDE ISBN, ART AND ARE
 ILLUSTRATED OR GOING TO PRESS.
 ORDER BY ADDING ON PHONE, USING
 THEOREM, ACCESS/ARCLAY CARD OR
 OFFICIAL ORDER, DESPATCHED BY
 SAME-DAY 15% CLASS POST, PRE-
 PAGO ORDERS FREE. PRODUCT DATA
 AVAILABLE ON REQUEST. REF. A20

 **Calco**
 Software

LAKE-SIDE HOUSE, KINGSTON HILL, SURBURY, KT2 7QJ TEL 01-544-325

Add your own

All about wedges

by Chris Preston

This article is all about **wedges**. And what are wedges? Well, they're very powerful things which helped to build the Pyramids and Stonehenge. No joy for all the Stone Age programmers reading this, though, because we are not going into do-it-yourself monolith building just yet (the editor - a true paeleolithic throw-back if ever I saw one - is, however, doing the research at this very moment).

What we are going to cover instead is 'wedging' extra commands for the Vic and the 64 and extra statements for Basic.

at 64
I scan
program).
and then ex
the Commodore
perform syntax
the lines are typed
add extra statements
reverse to the existing
provided that we also ad
routine to do the decoding
execution before Basic gets hold
of them and throws up a
NTAX ERROR.

This is a very good argument
against having syntax-checking at
any time, of course, so all those
people who boast that their
machines do something that
Commodore machines don't, now
have why - Commodore (or
rather Microsoft, who wrote the
Basic) knew better than that!

Basic wedging

So how can we intercept data
into the Basic program before the
interpreter gets hold of it?
Surely the interpreter is all in
ROM and cannot be changed?

Well, not all of the interpreter
is in ROM. There is one very
small but vitally important
subroutine in RAM in zero page.
It is called **CHRGET** and it gets
the next character from the Basic
program. All the data read by
the interpreter passes through
this routine, it's in RAM so we
can change it as much as we
want. This is the obvious place to
insert a patch.

This is the listing of **CHRGET**
for the Vic and the 64. (The
microtune is exactly the same in
all Commodore machines, but at
slightly different addresses.)

The pointer in \$7A and \$7B is
called **TEXTPTR** and points to the

incremented by one. This is the
With the exception of the
involving the use of the
GOSUB or GOTO instructions.
COMTAS If it
interpreter gets hold of the
of the start of the
TXTPTR - so the
read are those from

Changing CHRGET

So how are we to change it?
allow us to add some extra
commands? Figure 1 shows a
Now let's look at each section

Section Data	
Line	Instruction
0000	LDX #0
0001	LDX #0
0002	LDX #0
0003	LDX #0
0004	LDX #0
0005	LDX #0
0006	LDX #0
0007	LDX #0
0008	LDX #0
0009	LDX #0
000A	LDX #0
000B	LDX #0
000C	LDX #0
000D	LDX #0
000E	LDX #0
000F	LDX #0
0010	LDX #0
0011	LDX #0
0012	LDX #0
0013	LDX #0
0014	LDX #0
0015	LDX #0
0016	LDX #0
0017	LDX #0
0018	LDX #0
0019	LDX #0
001A	LDX #0
001B	LDX #0
001C	LDX #0
001D	LDX #0
001E	LDX #0
001F	LDX #0
0020	LDX #0
0021	LDX #0
0022	LDX #0
0023	LDX #0
0024	LDX #0
0025	LDX #0
0026	LDX #0
0027	LDX #0
0028	LDX #0
0029	LDX #0
002A	LDX #0
002B	LDX #0
002C	LDX #0
002D	LDX #0
002E	LDX #0
002F	LDX #0
0030	LDX #0
0031	LDX #0
0032	LDX #0
0033	LDX #0
0034	LDX #0
0035	LDX #0
0036	LDX #0
0037	LDX #0
0038	LDX #0
0039	LDX #0
003A	LDX #0
003B	LDX #0
003C	LDX #0
003D	LDX #0
003E	LDX #0
003F	LDX #0
0040	LDX #0
0041	LDX #0
0042	LDX #0
0043	LDX #0
0044	LDX #0
0045	LDX #0
0046	LDX #0
0047	LDX #0
0048	LDX #0
0049	LDX #0
004A	LDX #0
004B	LDX #0
004C	LDX #0
004D	LDX #0
004E	LDX #0
004F	LDX #0
0050	LDX #0
0051	LDX #0
0052	LDX #0
0053	LDX #0
0054	LDX #0
0055	LDX #0
0056	LDX #0
0057	LDX #0
0058	LDX #0
0059	LDX #0
005A	LDX #0
005B	LDX #0
005C	LDX #0
005D	LDX #0
005E	LDX #0
005F	LDX #0
0060	LDX #0
0061	LDX #0
0062	LDX #0
0063	LDX #0
0064	LDX #0
0065	LDX #0
0066	LDX #0
0067	LDX #0
0068	LDX #0
0069	LDX #0
006A	LDX #0
006B	LDX #0
006C	LDX #0
006D	LDX #0
006E	LDX #0
006F	LDX #0
0070	LDX #0
0071	LDX #0
0072	LDX #0
0073	LDX #0
0074	LDX #0
0075	LDX #0
0076	LDX #0
0077	LDX #0
0078	LDX #0
0079	LDX #0
007A	LDX #0
007B	LDX #0
007C	LDX #0
007D	LDX #0
007E	LDX #0
007F	LDX #0
0080	LDX #0
0081	LDX #0
0082	LDX #0
0083	LDX #0
0084	LDX #0
0085	LDX #0
0086	LDX #0
0087	LDX #0
0088	LDX #0
0089	LDX #0
008A	LDX #0
008B	LDX #0
008C	LDX #0
008D	LDX #0
008E	LDX #0
008F	LDX #0
0090	LDX #0
0091	LDX #0
0092	LDX #0
0093	LDX #0
0094	LDX #0
0095	LDX #0
0096	LDX #0
0097	LDX #0
0098	LDX #0
0099	LDX #0
009A	LDX #0
009B	LDX #0
009C	LDX #0
009D	LDX #0
009E	LDX #0
009F	LDX #0
00A0	LDX #0
00A1	LDX #0
00A2	LDX #0
00A3	LDX #0
00A4	LDX #0
00A5	LDX #0
00A6	LDX #0
00A7	LDX #0
00A8	LDX #0
00A9	LDX #0
00AA	LDX #0
00AB	LDX #0
00AC	LDX #0
00AD	LDX #0
00AE	LDX #0
00AF	LDX #0
00B0	LDX #0
00B1	LDX #0
00B2	LDX #0
00B3	LDX #0
00B4	LDX #0
00B5	LDX #0
00B6	LDX #0
00B7	LDX #0
00B8	LDX #0
00B9	LDX #0
00BA	LDX #0
00BB	LDX #0
00BC	LDX #0
00BD	LDX #0
00BE	LDX #0
00BF	LDX #0
00C0	LDX #0
00C1	LDX #0
00C2	LDX #0
00C3	LDX #0
00C4	LDX #0
00C5	LDX #0
00C6	LDX #0
00C7	LDX #0
00C8	LDX #0
00C9	LDX #0
00CA	LDX #0
00CB	LDX #0
00CC	LDX #0
00CD	LDX #0
00CE	LDX #0
00CF	LDX #0
00D0	LDX #0
00D1	LDX #0
00D2	LDX #0
00D3	LDX #0
00D4	LDX #0
00D5	LDX #0
00D6	LDX #0
00D7	LDX #0
00D8	LDX #0
00D9	LDX #0
00DA	LDX #0
00DB	LDX #0
00DC	LDX #0
00DD	LDX #0
00DE	LDX #0
00DF	LDX #0
00E0	LDX #0
00E1	LDX #0
00E2	LDX #0
00E3	LDX #0
00E4	LDX #0
00E5	LDX #0
00E6	LDX #0
00E7	LDX #0
00E8	LDX #0
00E9	LDX #0
00EA	LDX #0
00EB	LDX #0
00EC	LDX #0
00ED	LDX #0
00EE	LDX #0
00EF	LDX #0
00F0	LDX #0
00F1	LDX #0
00F2	LDX #0
00F3	LDX #0
00F4	LDX #0
00F5	LDX #0
00F6	LDX #0
00F7	LDX #0
00F8	LDX #0
00F9	LDX #0
00FA	LDX #0
00FB	LDX #0
00FC	LDX #0
00FD	LDX #0
00FE	LDX #0
00FF	LDX #0

The key section

DECODE, of course, is the most
important part of the program as
far as this article is concerned.
This is the section which actually
allows us to add the extra
commands we want.

The first thing that **DECODE**
has to do is save all the
processor registers on the stack.
It then looks at the return
address on the stack to see
where the call to **CHRGET** was
made from. This is important
because we only want to use the
extra commands when Basic is
actually executing a statement,
either in direct or deferred mode.
If we are not careful, we will
find ourselves executing the
HELLO subroutine when we are
keying a program line into the
machine!

Having made sure that Basic is
really running, we can now look
at the text to see if it matches
any of the commands in the
command table **COMTAS**. The
entries in this table are in normal
ASCII form, except that the last
character is shifted: that is, it
has \$80 added to it. This allows
DECODE to detect the end of a
command by using the \$80's
negative flag.

Each command is followed by



PET
Commodore 64
Unexpanded VIC
ZX Spectrum
ZX81
BBC Micro
Apple

All software for
the above computers

See us at
the Show

MICRO MATHS 34 program revision or self tuition course to O-Level. £24.90 (cassette)

ANIMATED ARITHMETIC Teaches using moving colour pictures (not words). Ages 3-8. £6.50 (disc £7.50).

MASTER MATHS (Apple, PET and CBM64 only). 80 program O-Level course or teacher's aid. Amazing graphics £90
... the programming standard is high. The programs are robust
TIMES EDUCATIONAL SUPPLEMENT

BRAINTEASERS (CBM64, BBC, ELECTRON) Book of programs to puzzle and amuse £5.95 "... you'll like this." ELECTRON USER

IMMEDIATE DESPATCH

Vic and 64 Micro Maths and CBM64 Master Maths. Please or send orders or requests for free catalogue (300 programs) to:

LCL

26 Avondale Ave
Staines, Middx.

Tel: 0784 58771

World leaders in Maths
educational software
(distributed in 24 countries)

GENEROUS TRADE
DISCOUNTS



DON'T JUST PLAY GAMES!

EDUCATIONAL SOFTWARE

for the

VIC-20 UNEXPANDED

Physics
Biology
Maths
Computer Studies
Science
Maths
Mathematics
Arithmetic
Reasoning
Knowledge

O level/CSE Revision Aid
O Level/CSE Revision Aid
CSE Revision
O Level/CSE Revision Aid
Revision 12/14 Years
Revision 12/14 Years
Revision 8/11 Years
Revision 7/10 Years
11+ Revision
Quiz 9/99 Years

Exceptional value at just £4.95 each post free

Immediate delivery by first class post

NO EXPANSION RAM NEEDED

Cheques/PO to:

Micro-De-Bug Consultancy
Dept CU, 60 Sir John's Road
Selly Park, Birmingham, B29 7ER
Tel: 021 472 7610

DEALER ENQUIRIES WELCOME

Programming

the address of the routine minus 1 - (we'll see why we have to take 1 off the address a little later) The end of the table is marked by a byte containing zero. The section of DECODE which checks the command name starts at DECOD7

Rather than use the CMP instruction to compare the character from the command table with the one from the Basic program, I use EOR. This will set the processor-zero flag if the two bytes are identical, but if the only difference is the top bit, it additionally leaves \$90 in the accumulator.

As the last character in the command has \$80 added to it, this allows you to get a match between "o" and "O" in this case it also allows you to use the Commodore form for abbreviated commands; so hE, hL, hI, and hZ will all work as well.

If two characters do not match (DECOD3), the program calls FENDCOM, this finds the end of a command in COMTAB by searching for a shifted character. We then skip over the jump address and test for the end of the table by testing for the next byte being a zero. If it is, then we have not found one of the extra commands, and the program restores all the 6502 registers and lets Basic get on with its job.

If the two characters are the same, the program jumps to DECOD1. This just increments the pointers (so that we can look at the next pair of characters) and then jumps back to DECOD3. If the two characters differ only in the top bit, bit 7, the program goes to DECOD2 which checks if we have reached the end of the command in COMTAB. If not, then we have found an abbreviated command, and the program has to move the pointer TMP0 to point to the end of the command.

In either case, when the program reaches DECOD3 we have found one of the extra commands, and the TMP0 points to the end of the command entry in COMTAB.

Up till now we have not altered TXTPTR - which is obviously important because we would want to jump back to the interpreter with TXTPTR intact if we could not find one of our commands in the Basic text. Now that we have identified a command, TXTPTR has to be moved to point to the end of the command so that later routines can use it.



All we have to do now is get the jump address from COMTAB and jump to the routine. TMP0 points to the last character in the command name, so we need to set the Y register to 1 to read the first byte of the address using the indirect indexed addressing mode.

As the 6502 does not have an indexed jump instruction, we have to do a little fiddle. What we do is to push the address on to the stack and then do a RTS. The processor pulls the address off the stack just as though it had been put there by a JSR instruction and jumps to the routine. Remember that we stored the address 1 in COMTAB. This is because the RTS instruction adds 1 to the value it pulls off the stack before jumping to it.

The new command

And so we come to the last section, a sample extra command, executed by the routine HELLO. This simply prints a silly message on the screen and then runs into a section called ENDCOM.

As its name suggests, this routine is where the program goes at the end of a command. All the routines to handle extra commands should jump here at the end. It restores the 6502 registers, then tests whether the interpreter is executing a program statement (in which case ENDCOM1 jumps to CHECK to continue execution) or a direct statement (whereupon the program returns to Basic at command level).

And that is it! All you have to do now is dream up your own commands. The command names are put in COMTAB, with the last character shifted (which adds \$80 to the value), followed by the address of the routine minus 1. Don't forget to put a zero byte at the end.

If you do design any useful commands, why not drop us a line that tells us about it? We'll print anything that looks good ...

VIC 20 — ADD ONS



The Vixen Switchable 16K RAM £34.95

The Vixen 16K switchable RAM cartridge is a unique approach to expanding your Vic-20. Being switchable from either 16K to 8K + 3K programs already in use based on the unexpanded Vic 20 are not obsolete. Supplied in attractive custom made case it simply plugs into the rear of the computer or motherboard. No additional power needed. High quality gold plated contacts ensure long trouble free life. Switches are recessed to avoid accidental operation. Designed and built in Britain. Guaranteed one year.



Light Pen

For the Vic-20. This allows the user to draw and paint in colour on the screen. It is ideal for screen layouts, graphic designs or as games aid. Screen layouts can be altered and erased as desired and the finished work can be saved on tape and reloaded for future use or editing. Excellent Horizontal and Vertical Resolution with superb stability. The pen works perfectly in the High Resolution Graphics mode, even though the resolution determined by your Vic-20 is only 1/4 pixel. Complete with software cassette and full instructions. £19.95

Spectravideo Quick Shot 2 Joystick

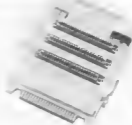
The most popular joystick, 8 position, 2 fire buttons PLUS Rapid-Fire switch. Left or Right handed index finger (Trigger Finger) and top-mounted Thumb operated Fire Button. Comfortable contoured ultra ergonomic design. Built-in stabilizing suction cups for impressive one-handed operation. Suitable for most computers with nine way socket. Vic-20, Commodore 64, Atari, Spectrum (with interface) etc. £10.50 inclusive.



Programmer's Aid. Basic Plus

A cartridge for the Vic-20 with 19 additional Basic commands including: Auto line numbering, Renumbering, Edit, Block delete, Insert Dump, Retrieve Set Border and paper colour, sound control, Modified reset facility and many others. Available in cartridge at £22.50 or in ROM for use with the Vixen motherboard at £14.95.

TREMIVER LTD
93a Pack Lane, Basingstoke, Hants. Tel: 0256 66116



The Vixen Motherboard £31.95

The expandable expansion system. Providing 4 additional cartridge slots plus ROM socket. The slots are switchable enabling cartridges to be left in place and selected as needed by switching thus avoiding constant handling and the danger of breakage. Having one socket at the rear enables further expansion. Used in conjunction with one or more Vixen RAMS full expansion can be achieved. ROM socket enables ROMS and Eproms to be fitted for future software programs, toolkits etc. A range of ROM based software is becoming available from the manufacturers. Industry standard Eproms, 2716, 2732 etc are readily available and easily programmed and copied. A sound investment for the serious user and serious games player which will not become obsolete.

New! Cassette Interface

For the Vic-20 and Commodore 64. Interface your Vic with any cassette player. Don't be tied to one you have to buy. If your Model has external Motor Control capability this interface will also control the MOTOR Stop/Start. Simple to use, supplied with leads and inexpensive. £14.95 inclusive.

CHROMASONIC PERSONAL COMPUTERS

6A PROFESSIONAL SYSTEM

COMMODORE 64 COMPUTER
1541 DISK DRIVE
DAISYWHEEL PRINTER
PHILIPS GREEN SCREEN MONITOR
ALL CONNECTING CABLES
EASYSCHPT WORD PROCESSING PROGRAM
SUPERBASE DATABASE PROGRAM
(EASYSCHPT & Superbase linked together)
BOX OF PAPER & BOX OF DISKETTES
1950 00
PAP £20



FABRICATION COMPUTER \$855.00

INCLUDING FREE SOFTWARE
EASYSRIPT, GAMES +
EASYSTOCK & EASYINANCE
SPECIAL OFFER PRICE £795.00
P&P £20

C= commodore
64

	D4	
e Commodore 64	£195 95
e 1541 disk drive	£195 95
e MPS-801 dot matrix printer	£295 95
e 1526 dot matrix printer	£149 95
f 1701 colour monitor	£195 95
c cassette deck	£39 10
c Quickshot joystick II	£10 50
b Intro to Basic (part 1)	£14 50
c Programmer's reference guide	£9 95
c Speech synthesiser	£49 50
a Microguide	£5 95
b Superbase 64	£88 00
Per speed	£50 00
Def: Result SX64	£99 00
h Samson Base by Commodore	£50 00
h Wonder III 40 on Cardbord	£89 95
h Mon 64	£39 95
h Sales Ledger by Anagarm	£75 00
h Port Base Ledger by Anagarm	£14 95
h Hatbit 64	£29 95
h Bridge 64	£50 35
h Omega etc	£69 95
h Multiplex	£28 75
h Zink II kit II	£35 95
h Quadbase	£35 95
h Suspended	£35 95
h Flight Simulator II	£17 95
h Riders of the Last Tomb	

Cz commodore
64 packs

64 STARTER PACK
Commodore 64
cassette deck
Intro to Basic (Part 1)
Dunkshot joystick
Game of our choice
ONLY £255.00
P&P £9

64 BEGINNERS PACK
Commodore 64
cassette deck
ONLY £229.00
P&P £8

64 BUSINESS PACK
Commodore 64
1541 disk drive
MPS 901 printer
Box of disks + box of
paper
Free EasyScript +
EasyFile - Intro to Basic
Part 1
ONLY £629

**64 HOME/BUSINESS
PACK**
Commodore 64
1541 disk drive
Box of 10 disks
ONLY £395.00
P&P £12

DIALOG HOME/BUSINESS PROGRAMS

QIMA Database is a powerful and versatile database system suitable for name and address files, stock, and combinations thereof.

- h. OFRA Database Mail Labels
- i. OFM Mail Labels
- j. Journal (Personal Diary)
- k. Dating thing system suitable for outlooking applications
- l. Catalogue structured filing system suitable for records & photos etc.
- m. to assist service & statement generation
- n.

PRINTERS Price code I

AK80 (Traction only) Dot matrix	£259.95	Drusy Strap 2000	£395.95
AK80FT (Traction & Traction) Dot matrix	£299.95	Jinjo Daisy Wheel	£11.95
AK80FT (Traction & Traction) Dot matrix	£399.95	BBC to Centronics cable	£19.95
AK80 (Traction & Traction) Dot matrix	£545.95	64 VIC to Centronics cable	£7.95
AK80 (Traction & Traction) Dot matrix		Software loan above	

MONITORS

Post code F except Turnable (D)	Post code F
Commodora 1701 Colour and Sound	
Microvitec 14" Colour	£195 95
BMC 12" Green screen	£247 25
Turntable stand for BMC	£119 95
Philips Green screen	£19 55
Fidelity RGB RGBY Composite and Sound	£79 00
	£228 00

MEDIA SUPPLIES

Drakes by Markham • 1 cabinet in bench				
5 0 0 401	\$17.95	5 0 0 501	\$22.95	
4 0 0 001	\$24.75	5 0 0 1001	\$25.25	
Computer paper 11" x 17" in boxes of 2500 sheets				
5 0 0 100	\$15.00	5 0 0 101	\$12.95	
• 100 sheets • 100 sheets • 100 sheets				
David Gevers				
NR	5 0 0 100	5 0 0 101	5 0 0 102	5 0 0 103
5 0 0 100	\$15.00	\$15.00	\$15.00	\$15.00
5 0 0 101	\$15.00	\$15.00	\$15.00	\$15.00
5 0 0 102	\$15.00	\$15.00	\$15.00	\$15.00
5 0 0 103	\$15.00	\$15.00	\$15.00	\$15.00

PRINTER RIBBON

• JUKI	£1.85
• EPSON	£5.00
• 1515/25	£6.20
• Daisy step	£5.52
• FX100	£9.85

Passage Codes

k	E0.65	
h	E1.00	
i	E2.00	
j	E3.00	
l	E8.00	See section
f	E14.00	See page 101

We guarantee all our products for 1 year, except 6A and Vic which is 2 years. Payment may be made by Access, Barclaycard, Bankers draft, Building Society cheque or cash. Sorry, cheques need 4 days clearance. We reserve the right to alter prices without prior notice.

THE BEST WAY TO
BUY A COMPUTER
CHROMASONIC IT.

48 Junction Road, Archway, London N19 5RD

TEL: 01-263 9493 and 9495

New shop at
238 Muswell Hill Broadway, London N10
01-883 3705

Seal of Approval

What's the Commodore Approved Products Scheme?

by Bohdan Buciac

There's something about a seal of approval that inspires enthusiasm and attracts confidence: like the muesli bar 'approved' by Olympic runners or the Royal coat of arms on your favourite marmalade. If you've got a keen eye for such insignia, you'll have noticed that Commodore has its own stamp of approval which it emblazons benignly on specially selected products from independent suppliers.

But there's more to Commodore's Approved Products Scheme than merely being allowed to display the 'approved' logo. Commodore doesn't (and can't be expected to) give something for nothing. So it charges a royalty to companies taking part, and gives a degree of promotional and marketing support in return: in some cases, it will actually take on a product under the Commodore banner.

That sounds reasonable, but how does the scheme work out in practice? What does it do for the manufacturer or software house — or for you, the customer?

Commodore introduced the Approved Products Scheme five years ago when the Pet, originally intended for the home computing market, surprisingly carved a sizeable niche for itself as a business machine. Faced with the problem of providing lead-and-go business software, Commodore began commissioning software houses to produce the goods.

Why didn't Commodore itself take the plunge into software? Simply because it saw itself as a shifter of hardware — as fuser, as extra development, more profit. Commodore big-wigs only reluctantly adapted their corporate strategy to include software and peripheral production (mainly for the Vic and Commodore 64) realising, rather tardily, that a Commodore-size pile of money can be made from this tributary of the market.

Ancient history

From the beginning, the scheme involved software houses paying Commodore a royalty of five per cent on net sales for the privilege of being included in Commodore's software catalogue.

The first catalogue appeared in the Autumn of 1979 and it supposedly helped Pet buyers choose appropriate software for their machines, reassured that it had Commodore's backing.

For its five per cent Commodore undertook to advise on product development and marketing, in theory it assessed product suitability too. And of course, the availability of the Approved Products Catalogue meant some promotion for suppliers with limited PR budgets.

Initially, the scheme grew in a haphazard way (Commodore itself grew in a haphazard way). Not all Pet-orientated products were included for a start. Not all suppliers were convinced of the Catalogue's value. And customers began to doubt (justifiably so, as it turned out) that all the products really had been assessed.

Fresh Impetus

Apparently that's all changed now. Enter Ian Slater — carrying a sackful of 'Fresh Impetus' — when he became Commodore's Applications Marketing Manager about two years ago. (As it happens, he's sub-

sequently moved on. But the expansion of the Scheme during 1983 and 1984 was largely his work.)

"If we were taking five per cent in royalties from these people, we ought to give them more support and back-up in other areas", he declared.

Slater's approach was to revamp the scheme by identifying areas in which Commodore's rich harvest of royalties could be most beneficially spent — for both parties.

The major one was joint promotion, in which Commodore works out a joint marketing strategy with the company selling the product — the company submits a plan linked to expected sales and a figure for expenditure is then thrashed out.

That sounds reasonably straightforward but it usually isn't — both parties invariably try to get the best deal for themselves. And since Commodore's putting up the money, guess who wins...

Ian Slater didn't feel Commodore's stance was dictatorial. "Certainly we have a controlling influence, but it is limited. We don't interfere in a company's marketing method or advertising style. But we do restrict them mentioning other hardware their products are compatible with; the product must be shown on a Commodore machine."

Probably that's not too bitter a pill to swallow when Slater was dangling that great Commodore Seal in front of your nose. But there's a bigger and juicier carrot too.

Money up front

"Three months from the date of signing on to the Scheme, we send a form to the company concerned to find out the volume of the product sold. We then issue a ninety-day invoice. That means that they've got six months to pay the royalty, having already received a sum up front from Commodore for joint marketing schemes."

Of course, that benefited Slater too; having seen the three-month figure, he was guaranteed a specific sum in royalties which would then be budgeted.

The amount spent on such marketing ventures can range from as little as £1,000 to £250,000 depending on the royalties paid (the latter is the sum recently forked out with Pegasus Software for its suite of accounting packages).

How that's spent is equally flexible and depends mainly on the size and amount of market penetration the company has already achieved. Generally, tactics include stalwarts like direct-mail, advertising, participation in Commodore shows, dealer support and even seminars and training courses.

And then there's the Approved Products Catalogue itself, the Bible for all things Commodore — and it really is all things. One glance through its pages reveals a diversity of product from a computer desk to a software package for administering the Public Utilities Street Works Act (1950).

Suppliers

"At present, the catalogue contains about 75 different companies - 50 when I took over," said Slater. "We don't expect it to grow any more. In fact, it'll probably go down to 70 and the number of different products listed will stay at around 250."

Keeping such a large amount of entries up to date inevitably involves problems, especially if the catalogue is published only twice each year. That means a new product may not appear for some considerable time after it's received approval - a factor that will dampen enthusiasm for the scheme? "Keeping up to date is a problem. But we try to overcome that by sending a list of new products out with our monthly dealer newsletters."

Business as usual

Despite the number and range of approved products, there is nothing in the catalogue for the Vic 20 and only a small amount (right at the back) for the 64, all business stuff.

So the dramatic advent of the Vic and 64 hasn't changed the nature of the Scheme, it is still mainly business orientated. Of course, Vic and 64 enthusiasts do have the two VicSoft catalogues, produced four times each year, but that's a mail-order scheme, not an approved products list.

The Vic and 64 have affected the scheme indirectly, though. "The Vic and 64 brought Commodore more downmarket, which meant that we had to pull down the price of business systems. So now we're looking for more mass-market business packages to add to the scheme; Micro-Sumplex for example, an accounting system for small retailers." At a mere £150, it's far cheaper than true 'business' packages. There's a great deal of software in the Catalogue that is far

cheaper than mainstream products running on vastly more expensive machines.

Getting approval

So how does a company get its product into the Approved Product Scheme? The answer's simple - with difficulty.

Slater didn't see the scheme expanding in size despite the fact that he received about 70 new products each week for assessment. Out of that lot, only one is likely to get through.

"First of all, our technical people have to see that the product really works. The supplier has then got to prove that it is selling and that it has an established dealer distribution network, its size will obviously depend on the nature of the product."

"Lastly, the company's got to be prepared to pay the five per cent royalty on turnover - that's on the dealer price, not what the end-user pays."

Those restrictions mean that the catalogue isn't saturated with too many similar products. As Ian Slater points out, "there's room for about five different accounting packages, for none of them are identical - but not for 15."

There's another side to the scheme; apart from getting approval, a product may be taken on by Commodore itself. But this happens very rarely - "we say no to 98 per cent of people who ask us to take on products". That's probably because Commodore itself usually takes the initiative. "If we decide that we need a specific software package for Commodore, we'll go out and get it."

One such product was Easy Script, a word processing package for the 64 developed by Precision Software. The strategy here is that

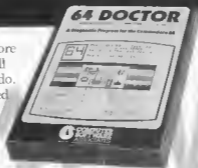
HEALTHCARE FOR YOUR HARDWARE

When your Commodore 64 seems distinctly unwell it's hard to know what to do.

Which is why you need 64 Doctor.

This special program will find the fault by a series of short diagnostic tests. And tell you exactly where the problem lies.

Included are tests for RAM, keyboard, disc-



drive, joysticks, datacassette, printer, audio and video displays.

So as well as saving you pounds in having someone check through the whole system for a fault, 64 Doctor will give you peace of mind.

You can give your system a check-up by visiting any good computer store including selected branches of Laskys, W.H. Smith and Boots.

 **PRACTICORP**

64 Doctor Tape £17.95 inc. VAT Disc £19.95 inc. VAT

Practicorp, Greenfield Road, Wharfedale, Industrial Estate, Leeds LS11 5NP. Tel: 0175 362771

COMMODORE APPLICATIONS CATALOGUE



Approval from the Approved?

the face of it, the Scheme appears beneficial both for Commodore (which acquires a ready-made software and peripherals base), and the supplier (which gets Commodore's market muscle and scope for its product). Does that theory work out in practice?

Nigel Lovett-Turner, director of Precision Software has no doubts. "A bloody good Scheme in principle, there's nothing to compare it with in America". On the other hand he now regrets having sold his rights to Commodore under the scheme.

"At the time we were an embryo company. So it was the right decision. Now we're an established software house, we reckon we should have made a better job of marketing... but we didn't have the muscle then."

The real advantage is that we sell in large volumes but we lose out. Commodore gives us a small royalty, we see it as a nuisance, but it's reasonable.

Using control meant not only accepting what looked to Precision as an unsatisfactory deal, but also having to accept Commodore's decision to give Easy Script away as a freebie with its 1541 disk drive. "I view the free offer with trepidation. It devalues the product given away in perse of no value."

words... but he does accept that larger volumes entail larger

And there's an incentive for Easy Script owners to buy Precision's own database package, Superbase 64.

Superbase 64 is merely an Approved Product. "It's a first class product which we want under our control now that we've grown and established. The penalty is we won't sell large volumes so quickly, it will be in the thousands, rather than hundreds of thousands."

Commodore merely pays Commodore the 5 per cent royalty and "hard" for a good marketing deal. "People getting involved with Commodore must make sure they're getting a good deal. That's like a warning."

One man band

Software may no longer need Commodore's marketing muscle, but Nigel Lovett-Turner points out that the Scheme should be a one-man-band operation.

Software's boss, Michael Hopps, is a teacher who runs the business from home. He developed Designer, a screen character program for his own use in schools. "Being designed for the home was low resolution so I couldn't get a publisher interested."

That Commodore took it on board as an Approved Product, perhaps because it offered a unique facility, which is obviously the things Ian Slater looks for. Designer has now sold more than 100 copies and Hopps has nothing but praise for Commodore. "They talk to me like a friend. They gave me access to technical support and lent me disk drives and other peripherals. Being in the Scheme meant that the product got much greater publicity... especially in schools, colleges and government departments."

The business back up and general confidence from Commodore enabled Michael Hopps to adapt Designer for the Commodore machine's higher capability has opened up the computer design field for him.

He has still greater ambitions for Designer 64... he wants Commodore to take on the product. "It would be easier for me if Commodore took on tasks like marketing, artwork and disk copying." He agrees, though, that while the product is technically sound it's not mass market enough for Commodore's liking.

Commodore

is that

Un-

not to

means

terms

is that

to one of

business

producing

yet conflict

they it could

If the

helps both

money, it's

But there

gets the

product,

assured

Commodore

Should we

If the Approved Product Scheme gives the independent developer a helping hand, it helps both Commodore and its independent suppliers. In the long run, if money, it's probably doing its job.

But there must also be something in it for the developer. The Scheme gets the assurance that Commodore has established a reputation for itself as a reliable product, and that the product has established a reputation for itself as a reliable product. But be quickly added, "There's no point in Commodore if the product doesn't work."

Should we approve it or not?

LOW PRICE HIGH QUALITY BUSINESS SOFTWARE FOR COMMODORE 64 AND 32K PET

PURCHASE AND SALES CONTROL £80 + VAT

Runs both purchase and sales ledgers with optional calculation of VAT from the gross or net amount, analysis by accounting period, 'due for payment' report, totals for net VAT and gross. Prints invoices on your own stationery laid out according to your own instructions.

NOMINAL LEDGER £60 + VAT

Produces trial balance and up to 20 reports in addition to profit and loss and balance sheet. This program is intended for use on its own, but it can be used in conjunction with our purchase and sales control.

PAYROLL £99.50 + VAT

Seven rates of overtime, all tax codes, pay slips, full deduction cards, etc.

COMPLETE INTEGRATED ACCOUNTING

System for the Commodore Pets, 4082, 8032, 8096 and Commodore 64, from **£400.00**

Write or phone for details and complete software list.

ELECTRONIC AIDS (TEWKESBURY) LTD

18, Drysdale Close, Wickhamford,
Eversham, Worcestershire, WR11 6RZ
Tel: 0386 831099



CBM 64 & VIC 20 CENTRONICS PRINTER INTERFACE VICSPRINT 2064



£49.95

INC VAT (£1 P&P)

**SMITH CORONA TP1
PLUS VICSPRINT 2064**

ONLY

£299.00

INC. VAT (CARRIAGE £7.50)

- *** A smart cartridge which plugs into the user port of either the CBM 64 or VIC 20, with a cable connecting the serial IEEE port on disc drive or computer plus a ribbon cable with 36 way centronics plug to plug into your printer
- *** Looks like 'standard' CBM 64 or VIC 20 printer (without graphics).
- *** Leaves cartridge port free for cartridge based software.
- *** Totally 'system software transparent' (try using a ribbon cable adaptor with 'Vicwriter').
- *** Works with 'Easyscript', 'Practical' etc. and a large range of printers including Juki 6100, CP80, Gemini 10X etc., etc.
- *** **TWO YEAR GUARANTEE** As manufacturers of this product we can offer a guarantee of two years with the utmost confidence.
- *** Please confirm your requirements and suitability with us before purchasing.
- *** Ribbon cable version available price £17.50 inc. VAT (£1 P&P) works with several packages but requires software adaptor tape to do listings etc., (£7.95).
- *** Overseas price (£43.43) add £3 P/P or £1 for B.F.P.O. orders.
- *** **AVAILABLE FROM THE MANUFACTURERS:**

RAM ELECTRONICS (FLEET) LTD., (CCI)
106 FLEET ROAD, FLEET, HAMPSHIRE GU13 8PA
Telephone: (02514) 25252.
Callers welcome Monday to Saturday (closed Wednesday)
Send cheque or postal orders or pay by VISA or ACCESS.

IDEAL FOR WORD PRO PRINTING, ETC.

Users

Commodore User Groups

around the world

Our annual survey

Part One -

everywhere but the States

We've been collecting and updating our information on users' clubs and groups that Victims, 64 enthusiasts and vicariously interested parties might want to join. Here's the list so far - and clubs not listed are invited to contact us with information.

Next month - clubs in the USA.

BRITAIN

National

ICUG

Independent Commodore Products User Group)
Membership Secretary
31 Lancaster Road
Notbury Park
Ipswich
Essex IG6 7EP

established and active, with good bi-monthly newsletter and lots of local groups (some listed here). Annual sub £10 (UK and Eve), £15.00 (Europe) £25 (elsewhere by air mail).

ACC

(Amateur Computer Club)
c/o Rupert Steele
& John's College
Oxford OX1 3JP

also well established and also active - covers all home computers. Technical bias. Local sub-groups.

National Association of Vic-20 Users

c/o S. Tommenak
20 Miner Road
Derwood Nottingham

Commodore 64 Independent Users Group

c/o C. Embrey
11 Sexton Avenue
Fallowfield Manchester

London

Association of London Computer Clubs

11 Compton Road
London N1 2PA

an umbrella organisation for no more than London-area enthusiasts. ALCC organises the London Computer Fair among other things.

North London Bobby Computer Club

c/o Dept of Electronic & Communications Engineering

Polytechnic of North London
Holloway Road
London N7 8DB

£30 ps for adults, £8 for unemployed and Poly students. Highly organised, lots of sub-sections including CBM

ICUG North London

c/o Barry Miles
Dept of Business Studies
Polytechnic of North London
Holloway Road
London N7 8DB

Vic 20 User Group

c/o Jim Chambers
Dept of Psychology
University College
26 Bedford Way
London WC1

Berks

ICUG (Slough)

c/o Brian Jones
Slough College of Higher Education
Wellington Street
Slough

£4 ps

Bucks

High Wycombe Commodore User Group

c/o Richard Onion
18 Frogmoor Close
Hogenden Valley
High Wycombe

£1 ps mostly for Vics.

Clywd

ICUG Clywd

c/o F Jones
77 Millbank Road
Rhyl

Derby

ICUG Derby

c/o Ray Davies
108 Newnham Road
Derby DE1 3GG

£3 ps Includes Vics.

Derby Microcomputer Society

c/o P Taylor
5 Park View Close
Allendale
Derby

£3 ps. Includes Vics and 64s

Devon

ICUG Devon

c/o M Stibbe
The Lawn
Lower Woodfield Road
Torquay

Dorset

Bridport Computer Club

c/o M J Higgins
BBC Transmitting Station
Rampsham Down
Maiden Newton
Dorchester

started in January.

Bournemouth Computer Club

c/o Peter Hibbs
54 Rushmore Avenue
Bournemouth BH11 9SE

£3 ps. 100 members. Includes Vics and 64s - subgroup for these

ICUG Dorset

c/o D Shave
97 Camford Cliffs Road
Poole BH13 7EP

Dyfed

ICUG Dyfed

c/o F Townsend
The Hill
Rhydlowen
Llandysall SA44 4QD

Essex

Banildon Computer Club

c/o Peter Silver
24 Havengore Pines

£5 ps

Brentwood Microcomputer Club

c/o Allan Holland
212 Woodland Avenue
Hutton
Brentwood CM13 1DA

.. Includes a section devoted to Commodore users

ICUG Essex

c/o Tony Surridge
37 Shelley Road Chelmsford

Gloucestershire

ICUG West of England

c/o Janet Rich
Rose Cottage
20 Old Court
Springhill Glos GL11 5PF

Hampshire

ICUG Hants

c/o Ron Geste
109 York Road
Farnborough Hants GU14 6NQ

Southampton ACC

c/o Paul Blinz
Gardenways
Chilworth Tower
Chilworth Southampton SO1 7JH

Local branch of Amateur Computer Club. 100 members, £5 ps. Includes Vics.

Herts

ICUG North Herts

c/o Brian Granger
73 Minehead Way
Stevenage SG1 2BZ

CRS Roosa Computer Club

c/o Robert Churchfield
2 Durham Road
Stevenage SG1 4HS

50p per meeting. Includes Vics and 64s

Humberside

Grimaby Computer Club

c/o J Lee
29 Park View
Greenhopes DN35 7TG

£8 ps. Includes Vics and 64s

Scunthorpe Computer Club

c/o D Needham
37 High Lees Road
Scunthorpe DN17 3QA

£5 ps. Includes Vics and 64s

Kent

GraveSEND Computer Club
c/o The extra Tutor Centre
36 The Terrace
GraveSEND Kent DA12 2BA

£8 pa (£3 for unwaged) About
50 members with a variety of
machines.

Orpington Computer Club
c/o Roger Pyatt
23 Arundel Drive Orpington

Includes Vics and 64s - and
CBRTTY, if that's your bag.

North Kent ACC
c/o Ian House
28 Canadian Avenue
Canford London SE26 3AS

Local branch of Amateur
Computer Club. Meets in Biggin
Hall.

ICPUG Canterbury
c/o R Moseley
Rosemont
Romney Hill Maidstone

ICPUG South East
c/o Mick Ryan
164 Chesterfield Drive
Riverhead Sevenoaks

Lanarkshire

ICPUG Lanark
c/o A Quin
Dept of Environmental Studies
College of Building and Printing
80 North Hanover Street
Glasgow G1 2BP

Lancs

Microcomputer Users
c/o Dave Walsh
19 St Margarets Way Blackburn
£2.50 pa. Includes Vics and 64s

Leicestershire

Beaumont Leys Micro Club
c/o I Lomb
103 Luns Grove Road
Beaumont Leys LE4 0UP
£2.50 pa. Includes Vics and 64s for
others. Mostly Vics

Merseyside

Wirral Microcomputer Users
Group
c/o Mike Keegan
208 Holmlands Drive
Oxton Birkenhead
£2.50 pa.

Middlesex

ICPUG West London
c/o Geoff Ecob
108 Teddington Park Road
Teddington

Norfolk

Vic-20 Cromer
c/o J Blair
7 Beach Road Cromer
Club based on local ICPUG
branch.

Northants

ICPUG Northants
c/o Peter Ashby
215 Lincoln Way
Corby

Vic-Pet Club
c/o Peter Wilson
26 North Cape Walk
Corby

Oxfordshire

ICPUG
c/o J Temple
'Kirabanda'
Rose Bank
Bloxham
ICPUG
c/o I Blyth
40 Wilmet Close Whitney

Strathclyde

ICPUG Ayr
c/o J Shankland
2 Strathdon Place Ayr

Sussex

East Grinstead Computer Club
c/o M Wellspring
18 Aviary Way
Crawley Down

Worcestershire

ICPUG South Midlands
c/o M Merriman
12 York Street
Stourport-on-Severn

IRELAND

Irish Amateur Computer Club
c/o Austin Vaughan
35 Monastery Drive
Dublin 22

has a Commodore section,
produces a newsletter

East Antrim Computer Club
c/o David Bohon
10 Carnickham Road
Carrickfergus
Co Antrim

£5 pa. David writes for us.

Commodore Users Group
c/o JJ Hildane
Cheyneys
Co Wicklow

£12 pa. Fortnightly meetings in
Dublin, newsletters, over 1,000
programs in library

EUROPE

Finland

Vic-Club
Matti Aarnio
Linnarjanki 2B7
SF-02940
Espoo 94

Netherlands

Pet Bench Exchange
Johan Schilde Copytronics
Burg van Suchtelenstraat 46
7413 XP Deventer
... Highly organized, very
professional. Lots of Vic/64
coverage

Italy

Vic Club
c/o Giuseppe Jacob
Sardo Giuseppe via Ortenso
no 8 57100 Livorno

Denmark

CRM Club DK
Fredriks Allé 83
DK-8000 Aarhus C
Keen and very active.

France

Le Club MICRO
College Pierre Dubois
71 rue Victor Bossel
93000 Laval

Club Vic-20 Commodore 64
Leon Brian
20 rue Leo Denardus
93250 Villetremble

Microtel
87 Route du Polygone
67100 Strasbourg

... Includes a Vic section.

Norway

Vic Club
Nedre Rangkelt 10
1750 Halden

Canada

Nova Scotia Commodore
Computers Users Group
Andrew Cornwall
66 Landrace Crescent
Dartmouth
N.S. B2W 2P9

Vancouver Pet Users Group
Membership Secretary
P.O. Box 91164
West Vancouver
British Columbia V7V 3N6

ELSEWHERE

Mexico

Asociación de Usuarios
Comodoro
c/o Alejandro Lopez Arechaga
Holtzen 174-6 Pao 18 DF

Korea

Commodore Users Club
c/o S K Cha
KPO Box 1437 Seoul

South Africa

Pretoria Commodore Computer
Club
c/o F Jordan
62 Monument Avenue
Lytleton Manor Pretoria 0140

Toronto Pet Users Group
Membership Secretary
Dept C
1912 A Avenue Road
Suite 1
Toronto M5M 4A1

CCCC
Roger Olanson
c/o Stanley Commodore
43 Coachwood Place
Calgary
Alberta T3H 1E1

VIC-TIMS
Greg Coes
2-830 Helena Street
Trail
British Columbia V1R 3K2

Bonnyville Vic Owners
Ed Winchen
Box 2100
Bonnyville Alberta T0A 0L0

New Zealand

Nelson Vic Users Group
c/o Peter Archer
PO Box 960 Nelson

Commodore Users Group
c/o Roger Allena
VHF Clubrooms
Hazel Avenue
Mount Rongitiri

Australia

Wonthaggi Computer Club
c/o Beth Toner
53 Wentworth Road
Wonthaggi 3905 Victoria

Vic-Ups
c/o Eddie Mills
45 Zarnie Place
Greenwood 6024
Western Australia
... Big and enthusiastic (over 140
members, two meals per week).

Vic 20 - CBM 64 Owners ENTER THE EXCITING WORLD OF ROBOT CONTROL WITH A

LWS

Robot Drive Interface

Interface 1: Gives COMPLETE INDEPENDENT computer control of up to 4 DC motors or 2 B-Pole stepper motors.

Stop/Start/Forward/Reverse is easily achieved by simple pulse commands. Range 6 - 12 volts.

£35.00

Interface 2: As above, but controls 2 DC motors or 1 B-Pole stepper

£25.00

Interface 3: As above, but controls 2 DC motors or 2 B-Pole stepper motors/relays. Range 6 - 18 volts.

£29.95

All interfaces are supplied with software, edge connectors and power leads. Prices include V.A.T. and P&P

NE Does not include: motors and DC power supply - can be supplied separately - please phone for quotes.

Vic 20 mother boards

3 slot switchable

£18.95

4 slot switchable

£21.50

Limited quantity of stepper motors available:
£3.00 each. Two for £15.00

STAINLESS & CO.,

Unit 2, Rolling Trading Estate,
London Rd, Barking, Essex IG11 8BU
Tel: 01-591 2900

TURN YOUR 64 INTO A REAL NUMBER CRUNCHER WITH THE

64-

STATSPower

PROFESSIONAL STATISTICS PACKAGE

Ideal for forecasting, business, schools, research workers, hobbyists, marketing, administration, and scientists

Comprehensive manual with many worked examples guides the user (novice or professional) through the use of various statistical techniques. Extremely user-friendly programs plus easy-to-follow manual virtually form a self-contained course in statistics

Contents:

Summary statistics (Means - arithmetic, geometric, harmonic, quadratic), Median, Quartiles, Semi-interquartile range, Variance, Standard Deviations, Skewness and Kurtosis measures. Deseasonalisation (weekly, monthly, quarterly), deseasonalised forecasts Multiple Regression (options include dummy variables user-specified data transformations), R squared, F-statistics, Durbin-Watson, etc. Linear and constant growth-rate trend estimation, T-Tests (including pair-wise T-Tests), Analysis of Variance One-way and two-way analysis.

Fantastic value at only **£12.95p** (Sterling) including also

Available on cassette or disk (£2 extra). Cheques & P.O.'s to

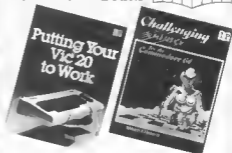
SCIENTIFIC SOFTWARE

BALGLASS HOUSE, 39 MAIN STREET,
HOWTH, CO DUBLIN, EIRE

Phone 326703 Dealer and distributor enquiries welcome

MAKE THE MOST OF YOUR COMPUTER.

INTERFACE PUBLICATIONS



- ☐ Mastering Machine Code on your Commodore 64
Mark Greenhalghs £7.95
- ☐ Mastering the Commodore 64
Mark Greenhalghs £7.95
- ☐ Challenging Games for the Commodore 64
William A Roberts £3.95
- ☐ Putting your Commodore 64 to Work (18 programs, including a complete word processor)
Chris Calender £4.95
- ☐ Putting your VIC 20 to Work
Tom Lau £4.95
- ☐ 50 Outstanding Programs for the VIC 20
Tim Hartnell £6.95
- ☐ Delving Deeper into your VIC 20
Philip Campbell £4.95
- ☐ Dynamic Camas for your VIC 20
Matthew Book £4.95
- ☐ Creating Adventure Programs on your Computer
Andrew Nelson £4.95
- ☐ The Art of Structured Programming
Peter Juliff £5.95
- ☐ The Easy Way to Program your New Computer
Tim Hartnell £3.95
- ☐ Getting Acquainted with your VIC 20
Tim Hartnell £6.95
- ☐ How to Program the Commodore 64
Robert Young £5.95

These books are available from most book and computer stores. In case of difficulty, order directly from us.

Interface Publications, Dept. QCU,
8-11 Kensington High Street, London W8 5NF.

Please send me the indicated books I enclose £ _____

Name _____

Address _____

INTERFACE PUBLICATIONS



We're the Experts.

(TRADE ONLY Interface Publications are distributed exclusively in the UK and
Ireland by W & S Dymally. Export trade handled by Interface Publications)

INFODISK 64

the friendly data-base for home or office.

See us at the **Commodore Show**
Stand A113

- Records up to 2400 characters and 180 fields - Up to 9 screen pages per record - Report generator - 19 function calculator - Almost instant retrieval of any record - Links to most word processors - Six ready-to-run applications and single disk utility included - Very easy to use

Ideal for first time user £75

INFOTAPE

- store up to 3000 data items (fields/records) with this totally flexible and versatile tape system which includes a 19 function calculator and report generator for creating mailing labels and tabular reports £36.95

MICROSTATS

- a comprehensive statistics package ideal for the "A" level or college student. Too many features to list £17.95 tape £19.95 disk

TOP SECRET

- converts your tape program into an AUTO-RUN system that is impossible to copy. So small, but we'll bet you'll never find the secret! £7.95

BRAIN MASTER

- pit your wits against the 64! Find the number before the computer finds yours - you can win but you have to be clever! Superb colour and music. Nine levels of difficulty £7.95

Prices include V.A.T. and p.p.h.

Payment by cheque or P.O.

To: BEAVER SOFTWARE SYSTEMS

Statham Melton Mowbray, Leics LE144HJ 0949 61318

Please send INFOTAPE/BRAIN MASTER/MICROSTATS/TOP

SECRET

Cheque/P.O. enclosed for £

Please send me further details about INFO-DISK 64

Name

Address

New for your CBM 64

Sunday League Cricket simulation game

HIT AND RUN

30 players to choose from giving thousands of different permutations for team composition. One or two player game (in fact the whole family could join in to decide tactics etc.)

Sunday league rules:- 40 overs per innings.

Bowlers are limited to eight overs and may not bowl more than two successive overs.

Conditions vary from match to match.

Wides, byes, no ball, etc. included.

HIT AND RUN

cassette £7.95 (plus 50p PP)

disk £9.50 (plus 50p PP)

Send S.A.E. (marked '64') for full lists of 64 software (Leisure, Educational and Business).

BYTEWELL, 203 COURT ROAD, BARRY, S.
GLAMORGAN CF5 7EW.

THE ANATOMY OF THE 1541 DISK DRIVE

This 300+ page book is the most comprehensive guide available for the 1541 disk drive users who wish to gain a deep understanding of the operating system.

Contents include:-

- Getting started
- Starting programs on disk
- Disk commands
- Sequential data storage
- Relative records
- Direct access commands
- DOS operation
- Diskette structure
- Utility programs
- ROM listing

Many examples and utilities are included

A major feature is the fully commented listings of the 1541 ROM

Price £14.95

THE ANATOMY OF THE 1541 DISK DRIVE



For the CBM-64

on the 1541 (RM+),

this package

contains most of

the language

elements found in

the 1541-FORTH

standard. Forth

programs are

usually faster and

shorter than

BASIC, and the



language can be

extended by

adding your own

keywords. A 45

page manual is in-

cluded

Price

£14.95

cassette or

£14.95

disk

THE ANATOMY OF THE COMMODORE 64

The ANATOMY OF THE COMMODORE 64 is a 300 page book for the CBM-64 owner who wants to gain a better understanding of the lesser known features of the computer.

Contents include:-

- ★ Machine language programming on the CBM-64
- ★ The next step - assembly language programming
- ★ A close up look at the CBM-64
- ★ Music synthesiser programs
- ★ Graphics programming
- ★ Details from a different viewpoint
- ★ Comparison of the 1541 and the Commodore 64
- ★ Input and output control

A major feature of the book is complete and fully commented listing of the built in operating system - essential reading for all machine code programmers

Price £14.95

SYNTHY-64

Music and sound synthesiser for the CBM-64. The CBM-64 has the most sophisticated sound capabilities of any personal computer series of PCs. However these facilities are difficult to use from BASIC, requiring a music using simple commands. SYNTHY-64 makes it easy to create music using simple commands. The package includes a detailed manual and sample compositions.

Price £14.95 cassette or £16.95 disk.

Synthy music albums are available on disk at £3.95 each (£8.95 if supplied with Synthy on same disk). These albums are currently available: Classics, American

and Christmas music.

Prices are inclusive of postage. Orders normally despatched within 48 hours. Many more products are available for 1541, Pac, and CBM-64. Send for free catalogue and details of discount of

TINY FORTH



ASSEMBLER/MONITOR 64

A low cost package with high price features to develop machine code programs on your 64. Written entirely in machine code.

Contents include:-

- Full screen editing of source programming
- Object code assembles to primary disk or tape
- Complete symbol table listing
- Source file chaining capabilities
- Standard MCS Technology syntax
- 11 function monitor

Available on disk only

Dealers enquiries welcome.

Adamsoft (Dept. CU), 18 Norwiche Avenue, Rochdale, Lancs OL11 5JZ.

BOOK

The Commodore 64 Program Book



The Book:

The Author:
The Publisher:
Price:
The Reviewer:
The Conclusion:

The Commodore 64 Program Book
 Vince Apps
 Phoenix Publishing
 £4.95
 Dermot Williams
 25 programs of modest standard for the prices of one commercial tape

This claims to be "THE Commodore 64 Program Book, with something for everyone... a blockbusting collection".

Well, for the reasonable price of £4.95 this 122-page paperback offers 25 programs to type in. They range from adventure games, 'arcade' games, and a flight simulator; to mazes, an educational Capital Cities quiz and a machine-code assembler/disassembler. The forward tells us why "we" wrote the book; since when do programmers use the royal plural?

The format of each program is sensible: a brief description of what it does, how to use it, line-by-line lists of graphics characters used and what the various routines do (like "fire laser and check for hit") and finally the program itself, dumped directly to a Commodore printer - on balance a wise choice, eliminating the possibility of printer errors though at the expense of some legibility and the use of the Commodore control-code mnemonics.

The programs fall into logical batches. First are the two adventure games - *Forbidden City* and *Pharaoh's Curse*. Although they take input only in the simple verb/noun format they do have the useful save-game feature for when you have to surrender the tiny TV set! You can then reload the data when you next come to play and continue from where you left off.

Dedicated Adventurers should be able to solve either the latest program in the book.

(Most) readers will be glad to hear that there is the usual complement of arcade-type games. These include such (original?) gems as *Bomber*, *Breakout*, and *Lunar Lander*. In fairness, they are quite good: colour, sound, sprites and redesigned shapes are all used - some games using all four. The reader didn't do the 64 justice, though; it is capable of far more than these programs asked of it. Also, being in Basic, some games were painfully slow.

Another 'game' is *Capitals*, a very simple 'name the city' game (let anyone could write within a few weeks of beginning to program). Similarly simple programs were *Metric Converter*, *Guess Book* and *Binary to Decimal Converter*. A rather disappointing line-remember program was given - it does not remember GOTOs or GOSUBs, so thoughts of being spared the tedious task of manual renumbering are dashed!

Anagram is a simple program which jumbles up the letters of words held in DATA statements and prompts the user to guess what the word should be. Instructions for expanding the vocabulary are included, though the data in the program as it stands is large and varied. Obviously parents could add a simpler list of words for young children; or, with suitable vocabulary, it could make an interesting party game.

More Code is a useful program which will transmit either a jumble of random letters, a word chosen from its vocabulary at random or a message inputted by the user. I must admit rather liking this program in all its simplicity.

Last, there's a useful utility simply called *Machine Code* which combines the functions of an assembler/disassembler with the useful features of save/load machine code; it also lets you examine memory, run machine code and move memory block. This would have been an excellent program... but for a few (major) faults.

The most important of these is the fact that it does not use standard 8002/8010 mnemonics. Instead the program employs an unwieldy system of the author's own concoction, where the normal three letters (i.e. LDA ADC) must be followed by the letters IM if the operand is immediate (i.e. LDA #ESC), Z if Zero page is to be used and X,Y,ZX or ZY if the operation is to be indexed with the X or Y register. And there's more - the program operates in decimal, not hex, so LDA\$33,Y would become LDAZY 34!

Anybody who knows 8002/8010 mnemonics will have great difficulty in adapting this system. For those brave enough to do so though, it offers use of (one-letter) labels; and a short sample program is given which shifts the screen one place to the left.

Overall opinion of the book? None of the programs were up to commercial standard - but then at the price you wouldn't expect them to be. I think the most accurate description I can give of the programs is 'magazine standard' - that is, less than commercial quality but nevertheless worth having.

Twentyfive programs for less than the price of a normal commercial program is good value; and somebody learning programming could take them apart one by one to reach a good understanding of many Basic concepts.



Purchase
Voucher

FREE with your Action Computer Supplies Catalogue.

- /// Master distributors for Sony 3 1/2" Micro Floppydisk
- /// Master distributors for Dysan diskettes
- /// ACCO computer system furniture
- /// Telephones manned 24 hours a day
- /// 1000 products including ribbons, print wheels, continuous stationery, labels, binders and accessories

Return the coupon to receive your catalogue



Action Computer Supplies
6 Abercorn Trading Estate
Manor Farm Road, Alperton
Wembley, Middlesex HA0 1WL

YOU ORDER BY A. WE DELIVER BY B.

01-903 3921

Please send me your catalogue PLUS
my £10 purchase voucher

NAME _____

COMPANY _____

ADDRESS _____

POST CODE _____

TELEPHONE NO. _____

SYSTEM USED _____

Action Computer Supplies FREEPOST Wembley Middle HA0 1WR



MSA

COMMODORE user

Monthly

The independent magazine for Commodore's small computers,
incorporating Vic Computing.

Please enter my annual subscription to Commodore User. I enclose a cheque/postal order made payable to VIC COMPUTING LTD for...

- ☐ £12.00 U.K. ... or use your
☐ £18.00 EUROPE Access/Mastercharge
☐ £32.00 Rest of world number: _____

Now return this form with your cheque/postal order to:-

**COMMODORE USER SUBSCRIPTIONS
BKT SUBSCRIPTION SERVICES
DOWGATE WORKS, DOUGLAS ROAD
TONBRIDGE, KENT TN9 2TS**

Commodore User is published monthly commencing with
the October 1983 issue. Unless you specify otherwise, your
subscription will commence with the next issue.

NAME: _____

ADDRESS _____

POSTCODE _____

SIGNED: _____

DATED: _____

The Personal Computer Handbook



The Book:

The Personal Computer Handbook

The Author:

Peter Rodwell

The Publisher:

Dorling Kindersley

The Price:

£8.95 paperback, £12.95

The Reviewer:

Richard Rodak

The Conclusion:

Good book, shame about the price (and the default computers)

General books on home computing are usually written from a standard recipe: a potted history of the computer and a simple description of the way it works. Sometimes a few more ingredients are sprinkled around to make the book worthwhile.

The Personal Computer Handbook, not surprisingly, has been cooked up in much the same way. But Peter Rodwell, its author, has tried to be more complete and more practical, and so he should - he's the last editor but one of Personal Computer World magazine. So has this more exhaustive approach achieved a spicier and more satisfying book?

The book's outward appearance alone encourages you to breeze through it, that's if you're not averse to the now obligatory cover shot of Junior teaching Dad how to compute. It's a large book (about the size of a Seano annual), and its bright, colourful, lavishly illustrated with photos and detailed drawings; and the print is clear and bold.

The chapters, or 'modules' as the author prefers to call them (yuk!), are colour-coded and self-contained so you can dip into any part at leisure. You're helped by a meticulous system of cross-referencing. If you're reading about computer memory, for example, the mention of logic gates refers you back to the appropriate module.

Another clever and useful feature is the way main text is kept separate from the illustrations and their captions. The captions generally expand on the text as you could spend along or stop and take advantage of the greater depth offered.

In the book does have an overall structure, it falls neatly into six parts each with an Introduction that clears over the main issues. That may not be useful to computer buffs but the history of computing it contains certainly is worth a read. It is concise and has some marvellous photos - like the one of Charles Babbage's Difference Engine, that improbable and ultimately useless pile of iron. All the great computer intellects are here, most of them with funny faces - like Hollerith, Schenck and Vannevar Bush.

The section on how computers work will be equally gripping for the inquisitive. Again, it uses illustrations to add substantially to our understanding, like many explanations of a computer's insides, this one doesn't attempt a gloss over difficult concepts. They remain difficult - logic gates, the central processor, binary, memory et al. All are discussed with a clarity and precision of expression that's rare among computer writers.

The same goes for the modules on hardware and software. If you couldn't visualise the complexity of a Z80 chip, say, you'll see it exploded to the size of a table-mat and find out how it's made into the bargain. Likewise, there's a lot of outwary drawings so you can 'see' inside a disk drive or a cartridge. That may be valuable mainly if it stops you opening the real thing and watch in horror as all the bits fall irretrievably out.

A real practical section is the one on Basic programming. It gives not only a flavour of the language but also examples of loops, arrays and suchlike. For the more experienced, there's a discussion of more advanced languages like Pascal, C, Logo, Fort and examples of the type of programs they produce. The same goes for operating systems, Rodwell answers those nagging questions about why software won't run on certain machines and why some operating systems are better than others.

Those are the plus points, but there are a few dubious areas in this book. Why devote a chapter to the basics of setting up a computer when the machine's manual would surely cover those points - and do so more specifically, too? (Incidentally Rodwell uses the Sinclair Spectrum as an example throughout.)

Neither are there any real revelations in the section supposedly devoted to the future of computers - a great deal of time is spent talking about seeming irrelevances like video and compact disks. The section on choosing a computer is equally unsatisfying: there is some sound yet diluted advice but Rodwell goes on to give a selection of the more popular micros many of which are already out of date. Such is the nature of computing, but Peter Rodwell of all people should know that if this book is to have lasting value, better stick to less ephemeral areas.

Learning about computers is a process of stripping away darkness. But there are always some nagging black patches that remain. Rodwell tries to give a rounded picture, and succeeds very well. His style is lucid - perhaps a little dry, but the copious illustrations make up for that.

Some sections, though, amount to mere padding. Others, like the descriptions of applications software for business, may be relevant to only a few readers. But maybe that's the price you pay for completeness.

Moreover, the price you pay looks a bit high for an all-purpose introduction. It's having some very good presentation, layout and illustration - and on balance, it's worth paying for.

The Commodore 64 Handbook



The Book:
The Authors:

The Commodore 64 Handbook
Peter Lupton and Fraser Robinson

The Publisher:
The Price:
The Reviewer:
The Conclusion:

Century Publishing Co
£5.95
Simon Potter
Not a handbook, but an uninspiringly ok introduction

If you were writing a book about the 64, you'd almost certainly call it 'Getting the most from the 64' or 'The 64 Handbook'. That at least seems to be the obvious conclusion from the flood of Commodore books hurtling like lemmings from the world's publishers. There are so many, in fact, that the average punter could well be forgiven for ignoring the claims in the title.

Book jacket blurbs and titles are becoming debased: you know full well that the book probably won't help you 'get the most from' your 64, or it won't be an all-you-need-to-know 'handbook', instead it'll be another supplement to the 64's manual, introducing the 64 and expanding on those bits the manual glosses over.

The best you can hope for is that it will give you some extra information, or that it will help you quickly to locate some fact you need, or that it will demonstrate the use of the 64 and the commands available (a sinner to anyone who can tell me here, why, when and where to use WAIT).

And so to *The Commodore 64 Handbook*. Now, let's be viciously literal. A handbook? It seems to me should be a handy compendium: it should tell you all you might want to know (and I do mean *all*), and it should do so in a useful and useable fashion.

Strike one for Messrs Lupton and Robinson. They've written yet another beginner's guide to the 64 that goes a bit further than the manual, as such it's not a bad try. A bit me-too in its nature and not particularly lively in its style, but still adequate. There are some oddities of construction, given that it is for novices, like the tuning screw at the back of the 64 is identified in the caption to a drawing (most 64 books ignore it, but the thing isn't mentioned at all in the section on tuning). You're told all about variables and arrays (heavy stuff for page 27, but quite well explained) before you're introduced to the use of cassettes (all part of the basics, surely). The TI clock, a genial extra in the 64, is introduced before the fundamental stuff like subroutines. And so on.

At the other end of the book are the usual appendices: most of them appear only reprinted en masse from the 64 manual. Which you'll have with your 64 anyway. To my mind, appendices should give additional information, why not a decent memory map, at the very least?

More crucially, the book has two significant deficiencies as a reference. The authors simply haven't presented their information in an easy-to-use reference form (though end-of-chapter summaries and a decent index do represent a nod in that direction). They haven't covered everything: nothing about disks and printers (for instance, nothing about off-the-shelf package either).

And sometimes what they do cover is cursory in the extreme. CMD is mentioned only in passing, and there's nothing about the alternative use of CMC or PRNT# in addressing I/O channels. You get a mere five pages in Chapter 16 on 'Advanced Techniques', though truth to tell it does contain a plug for something called 'The Advanced Commodore 64 Handbook'. Although the advanced techniques in question are machine-code subroutines (a case of helpful mention of SYS and USR); there's half a page on WAIT that concludes by saying the command is unnecessary and there's a couple of pages on designing good programs which misdefines 'structured programming' and cites the use of some forethought, and omits any explanation of flow charting.

What's worse, the book falls into the style of so many 64 books: most of the examples are mathematical and many are pointless, surely there must be a better way of illustrating loops and decisions than a long program that counts numbers into ascending order. Which leads on to a major criticism like most 64 books, that one tells you a lot about Basic commands without explaining how, why and where you might actually want to use them.

The authors can't have it both ways: either the book is a reference handbook or it's a beginner's introduction. It succeeds as neither. As an intro to the 64, it's nowhere and no better than a dozen alternatives: good second on pages and sprites, for instance, but off on sound.

Get the idea? Well, don't bother getting the book - not if you want to use it as a genuine handbook. As an intro, it'll do as well as any until something really good comes along.

Saxon Computing

FIGARO 4

for

commodore 64

Much more than a business graphics package or spreadsheet, FIGARO 4 is a powerful numeric database system for maintaining lists of numbers and their descriptive data, plus bar graphics and slide show option. Easy-to-use menus provide built-in statistics, calculating routines, and even seasonal forecasting, with full data security.



Features include:
Create New File, Open File, Close File, Disk Directory, New Series, Copy Data, Shift Data Left, Shift Data Right, Add, Subtract, Multiply, Divide, Cumulate, Display Data, Print Data, Enter Data, Amend Data, Mean, Harmonic Mean, Maximum, Minimum, Range, Moving Total, Moving Averages, Standard Deviation, Correlation Coefficient, Growth Rates, Indices, Percentages, Seasonal Forecasting, Bar Charts, Line Charts, Dual Line Charts, Mixed Bar & Line Charts, Cluster Bar Charts, Pie Charts (all with Text and Number Graphics mixed on the screen), Screen Change Graphics or Sample Slide Show Option.

Ideal for Sales, Marketing, Finance, Education, Local Authorities, Biology, Meteorology and many other applications.

£86.25
inc VAT and P&P

Supplied on disk with a comprehensive manual, complete with worked examples.

Trade and export enquiries to:
CMS Cornforth Marketing Services Ltd
41 Brighton Road, Godalming, Surrey GU7 1NT
Tel. 0486 4599 Telex: 877837 MERIT G
Mail Orders, Access and Barclaycard to:
Saxon Computing,
3 St. Catherine's Drive, Leconfield,
Beverley, North Humberside HU17 7NT
Tel. 0401 50697

Trade/Export Enquiries Welcome
See us on Stand A4
at the Commodore Show

DELTA FLEX

Commodore 64

To stimulate your imagination and test your skill, try one of our puzzle games on cassette.

1. **Branteaser** – games include Stack-A-Disc, Battleships, Colour Flip, Codebreaker, Number Cruncher. Excellent value at only £5.00 inc. P&P.

2. **Puzzleflex** – two great games to test your skill and provide hours of fun.

Memory Match – requires you to find hidden characters and match these together against the computer which can be selected to play at 6 levels of difficulty.

Solitaire – is an absorbing test of skill and concentration. It looks easy, but can you solve it?

Also great value at only £5.00 inc. P&P.

To place your order, just fill in the coupon below. Tick boxes required.

Please send me

Branteaser Cassette ☐

Puzzleflex Cassette ☐

I enclose a cheque/P.O. for £..... made payable to Deltaflex

Name

Address

Deltaflex, 6 Magdalen Drive, Woodbridge, Suffolk IP12 4EP

ELECTRONICS

Vic 20 computers have been talking back to their owners for quite some time. Now, Commodore 64 users can have that same pleasure too—by getting an **ADMAN SPEECH SYNTHESIZER**. It's word power is endless as there is no set vocabulary. Vic operation is simple. The 64 elements of English speech are pre-programmed to let you put your words together as soon as you switch on. Just imagine...you'll be able to program your own adventure games with characters that can actually talk. Many leading software houses are now developing programs that are compatible with the **Adman 64 Speech Synthesizer**.

First releases are:
Twin Kingdom Valley (Bug-Byte) Attack—Attack (Voyager) 3D Silicon Fish (Thor Computer Software)

For Vic 20 users there are also
8k and 16k RAM PACKS and a 3 PORT EXPANSION MOTHERBOARD

Prices around

8k Ram Pack £29.95
16k Ram Pack £39.95
Motherboard £19.95
Speech Synthesizer £49.95

Adman computer accessories are available from all good computer shops. For further information why not take a leaf from our speech synthesizer ask for it! See your local dealer or simply post the coupon.

Dept. C, Adman Electronics Ltd., Ripon Way, Harrogate, N Yorks, HG1 2AU, Tel. 0621 740972

Adman Electronics Ltd is a member of the Adman Leisure Group PLC

Please send me information on Adman Vic 20 Accessories

Name

Address

5/84 64/Commodore User

The Commodore 64 finds its voice!

SPEECH SYNTHESIZER NOW AVAILABLE FOR COMMODORE 64 PRICE AROUND £49.95

CHARTS

VIC 20 TOP 20

1	♦	Crazy Kong	Interceptor
2	♦	Jet Pac	Ultimate
3	♦	Wiz and Princess	Melbourne
4	♦	Hell Gate	Llamasoft
5	♦	Snooker	Thorn
6	NE	Sub Commander	Commodore
7	♦	Sargon II Chess	Ferranti
8	♦	Flight 015	Terminal
9	NE	Scramble	Microanics
10	NE	Chariot Race	Commodore
11	♦	Emmet Attack	Llamasoft
12	♦	Metagalactic Llamas	Rabbit
13	NE	Dam Buster	Imagine
14	♦	Arcadia	Llamasoft
15	RE	Matrix	Rabbit
16	♦	Paratrooper	Soft Projects
17	♦	Space Swarm	Llamasoft
18	♦	Gridrunner	Quicksilva
19	♦	Skyhawk	Thorn
20	NE	Mine Madness	

TOP 5 MANUFACTURERS:

LLAMASOFT
INTERCEPTOR
ANIROG
COMMODORE
IMAGINE

An independent directory of best selling games, compiled by R.A.M./C. for Commodore User, representing retail sales for preceding 4 weeks. Data drawn primarily from independent specialist computer outlets.

- Going UP
- Going DOWN
- ♦ STATIC
- NE New Entry
- RE Re-Entry

CBM 64 TOP 20

1	♦	Space Pilot	
2	♦	Manic Miner	
3	♦	Hunchback	Soft Projects
4	♦	Scuba Dive	Ocean
5	♦	Chinese Juggler	Martech/Dura
6	♦	Pilot 64	Ocean
7	♦	Forbidden Forest	Abbot
8	NE	International Football	Cosmos
9	♦	Revenge of M.C.'s	Commodore
10	NE	Quick Thinking	Llamasoft
11	NE	Aztec Challenge	Mirrorsoft
12	RE	Hovver Bovver	Cosmos
13	NE	Colossus Chess	Llamasoft
14	NE	Speed Duel 64	CDI
15	♦	Metagalactic Llamas	DK Tronics
16	♦	Boogaboo the Flea	Llamasoft
17	NE	Ugh!	Quicksilva
18	♦	Super Pipeline	Softtek
19	♦	China Miner	Tasket
20	NE	Splat 64	Interceptor

TOP 5 MANUFACTURERS:

LLAMASOFT
ANIROG
OCEAN
INTERCEPTOR
TASKSET

DON'T GET LEFT BEHIND!

Use the order coupon below to make sure you get your monthly copy

To my newsagent:

Please send/reserve me a copy of Commodore User every month until further notice.

Name: _____
Address: _____

NEW ORIGINAL GAMES FOR THE COMMODORE 64

• **NIGHTMARE PARK** is in fact a compendium of 14 games. The task of the user is to gain as many points as possible travelling through a maze beset by obstacles at every turn. These infuriating obstacles are overcome by a combination of skill, sharp reflexes and by sheer good luck making Nightmare Park a suitable game for all ages.

PRICE £7.99

• **DOTS & BOXES** is an intelligent game where the user and the computer take turns in completing boxes by drawing a line between two dots. The aim of the game is to win the most boxes whilst skillfully minimising the number of boxes given away to the computer.

PRICE £6.95

• **CHOPPER LAND** Your chopper is chartered to transfer goods from your base and land SAFELY. An exciting new game full of surprises.

£7.99

1 VOUCHER

• **HEXAPAWN** For strategic and persistent play. The opponent (computer) has no initial strategy but is programmed to learn from the user's wins to improve its own strategy.

£5.95

Order any of these games and send 2 vouchers to receive your free copy of Hexapawn

SEND CHEQUES/PO: A.R. SOFTWARE

86, Avonbrooke Crescent, Hamilton Scotland
Tel: 0698 282036

DEALER ENQUIRIES WELCOME

CALLING ALL

VIC 20™ OWNERS

WE WANT YOUR NAME ON OUR MAILING LIST
SO FOR JUST £5.00 WE WILL SEND YOU:

- 1 A superb machine language Vic 20 'KONG' Type Game that runs on any Vic 20 even unexpanded but which is so sophisticated you'll be amazed how we crammed it all into 3.5K (This is one of our top Games Programs as we want to take this opportunity to prove to you how good our programs are)
- 2 A voucher for £4.00 off your next purchase from us
- 3 Our newsletter on all the exciting Vic 20 programs from New Zealand where we produce Software even better than we do Lamb

NORMAL VALUE £7.95

**YOU PAY ONLY £5.00 AND THAT
INCLUDES AIRMAIL POSTAGE
(REAL STAMPS) FROM N.Z.
MONEY BACK GUARANTEE**

VIC 20 is a trademark of Commodore Electronics Ltd
RETURN PROMPTLY IF NOT SATISFIED FOR FULL REFUND

NAME

ADDRESS

I ENCLOSE MONEY ORDER/POSTAL NOTE FOR £5.00
Charge my VISA MASTER CHARGE DINERS AMERICAN
EXPRESS Delete as applicable

No Expiry Date

Signature
POST TO: KIWI COMPUTER ACCESSORIES LTD
P.O. BOX 31 274 AUCKLAND NEW ZEALAND

FRUSTRATED!

by the problems of attaching Centronics
I/F printers to the CBM 64 and VIC 20?

Don't muck about —

- ★ Waiting an age while the printer prints a page
- ★ Converting 'CBM CODES' to ASCII
- ★ Getting clumsy printer drivers to work on your system
- ★ Trying to understand listings made on ASCII printers
- ★ Losing data at the end of lines, C.R., and off the end of lines
- ★ Repeatedly dumping on the printer for multiple copies

**Solve all these problems — and more with the
S.P.B. Serial IEEE Printer Buffer Interface**

**FEATURES ★ 11766 character buffer ★ Full
buffer control**

- ★ Code conversion ★ Repeat Mode (up to 255 times) ★
- ★ List Mode (Converts listing to an easy to read form)
- ★ Emulates compatible serial printer commands
- ★ Manual control of printing

Easy to use ★ Dump your text to the printer

**In seconds using standard I/O commands
(OPEN n, PRINT#n, CMO# etc) and let the printer get on
with it! USE YOUR COMPUTER FOR COMPUTING!**

TWO VERSIONS AVAILABLE:—

- i. with centronics compatible interface
- ii. with keyboard scanner interface for direct connection of cheap daisy-wheel typewriters for low-cost letter quality word processing

SEND:
Self addressed envelope
for full details and
order form

W.J. Salter
'Beavesty'
Trevorsey, Treburick,
Wadebridge, Cornwall
PL27 7LE

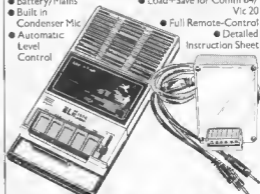
COMMODORE COMPATIBLE CASSETTE RECORDER AND CASSETTE INTERFACE ONLY £29.95

**ELFTONE 08011
£19.95**

- Battery/Main
- Built in
Condenser Mic
- Automatic
Level
Control

**COMM. CASSETTE
INTERFACE — £9.95**

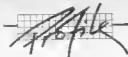
- Load+Save for Comm 64/
Vic 20
- Full Remote-Control
- Detailed
Instruction Sheet



Protek



Protek Computing Ltd, 1A Young Square,
Brussels Industrial Park, Livingston, West Lothian, 2066 0553.



Picking on Paramount

Bright ideas and bushy tails versus the money machine
by Bohdan Buciak

Paramount still thinks it can make a splash before the tide goes out. It is reaping on Commodore machines, has a small range of good games - and has acquired the obligatory teenage-genius programmer. Web that lot, it confidently expects to turn over £1 million in its first year. Bohdan Buciak trekked to Teeside for a chat with Paramount's protagonists.

Paramount lives in a modest row of terraced shops in the modest town of Stockton-on-Tees. Across the road is the railway station from which Stephenson's Rocket used to trundle up the tracks to Darlington. Stockton is proud of that.

But Bob Horsham and John Chapman, Paramount's joint founders, aren't Stockton men, they're both from Yorkshires, and in the true brass-from-muck tradition they both describe themselves as entrepreneurs of sorts.

"My whole experience is in marketing and promoting and promoting people," the middle-aged Horsham reels off a list of areas he's worked in, jewelry and bling, discos and clubs. Perhaps not the best pedigree on which to enter the specialised and often cut-throat software industry?

Chapman to the rescue. "But we're both natural businessmen and we know that if there's room for one there's room for another." That sounds pretty casual but a good deal of preliminary research was done, mainly by Bob Horsham ("I was having a lazy period - things weren't going too well for me in business"). Horsham found himself with plenty of spare time to look for new areas in which to exercise his promotional skills. "The idea of computers began to hook me and I knew there was an opportunity there - if only I could find it."

more about that later.) "It was difficult to get my concept of promoting programmers over at the time - and John Chapman thought I was crazy." Of course, it's easier to swallow those ideas now that the likes of Geoff Minter and Eugene Evans have reached cult-figure status.

At the same time Horsham bought a Vic and then a 64; and he decided those were the best machines to write for - perhaps not from the technical viewpoint, but certainly in terms of selling prospects.

Horsham and Chapman duly combined forces and moved to Stockton where the latter had most of his business interests. But that wasn't their main reason for settling on Teeside. "We knew that Teeside Polytechnic had a good reputation for turning out computer people and the area was totally unexploited. So we placed advertisements for programmers in the local press."

They formed Workstations, a consultancy operation that arranged for ghost writers to work for already established

software houses. It seemed natural from there to go one step further and form a software house of their own. "We chose to call it 'Paramount' - sounded suitably impressive."

Setting up Paramount enabled Bob Horsham to pursue his dream of promoting and managing a genius programmer "we interviewed a lot of people." Most were youngsters who, according to Horsham, wouldn't or couldn't fit in with his plans. "I wanted an old head on young shoulders, somebody who could be successfully managed."

A star is born

Paramount eventually found three programmers. Only one of them looked to Horsham to have star potential - a sixteen-year-old school leaver with the unlikely name of Jason Benham.

Jason started work on the Vic and produced Outback, an original yet somewhat bizarre game featuring the likes of swagmen and kangaroos. That was Paramount's first product - it

appeared last November. Since then, Jason has written Jigger (a 'Frogger' clone for keep-fit enthusiasts that seems to sell despite the longevity of the basic idea) and Chocobloc, also for the Vic. For the 64, he's converted Outback and written Megawar. That amounts to all but one of Paramount's current title range - pretty good going.

Jason had to accustom himself to Paramount's ways of working. His first version of Outback wasn't accepted straight away. Both Horsham and Chapman made suggestions which, fortunately, Jason was able to implement himself. Countdown (the only Commodore game Jason hasn't written) was different; the teenager who'd originally submitted the program couldn't rework it himself.

That was where the technical expertise available at Teeside Poly came in. "We employ computer scientists on a freelance basis to modify programs and give advice," says Horsham. So why don't these people write their own



Promotional Ideas

He thinks he did find it, his idea being to promote games programmers as personalities. "I reckoned you could have an Elvis Presley of leisure software programming" (Horsham prefers 'leisure' to 'games' software - but

Just what the world needs, another games company. Paramount Software is pretty small and pretty young compared with the giants of the games software industry, who started shovelling out games and shovelling in the money a long time ago (which means all of two or three years). Now, the games market is reaching saturation point and it looks as though only the large concerns with the financial muscle will come out winners - money matters like 'distribution' and 'marketing' count more than the quality of games in this business.



programs? "Computer scientists know a lot of routines but don't tend to have finished programs." What he's saying is that the youngsters usually have the original concepts, the creativity; but they may lack the technical ability, the logic or even the patience to turn that idea into a good game. And equally, that the established computer professional may be able to do it right - but lacks the original ideas.

Paramount is keen for local youngsters to come in and get their work assessed. It's now making alterations to its modest office to accommodate them. But kids aren't given the opportunity to discuss their work with technical experts. "We can't send kids away with development ideas because that's chucking away our commercial secrets", confides Chapman.

That's followed by "We find they don't get on anyway - kids don't seem to be motivated by the really technical stuff". That may or may not be true. Youngsters could certainly benefit from talking to the experts. But there is a premium on originality in the software industry. Letting secrets go is bad business - even if it does sound a little calous.

So the premise is that the youngsters will have the kernel of an idea and Paramount will try to mould it. "We know what we want the finished product to be but not how to do it. Sometimes we make demands that technically can't be met. But it's always a team effort." Jason has probably experienced that way of working more than most.

Rich pickings

Bob Hornham has strong views on that team-spirit idea. "I can only work with people who are willing to be managed, with whom we can work towards a



common aim on a long-term basis" (that aim is obviously wealth for all concerned).

It might sound as though Hornham's interested only in people who will do as they're told. He denies that strongly and points to the often deluded get-rich-quick visions youngsters seem to have about the games software industry. He's probably trying to be more cautious when he makes the admonition, "you don't make a fortune overnight". Even if some people demonstrably have done just that.

So what kind of money do programmers make at Paramount? The company generally employs them on a freelance basis and they receive only a royalty on sales. That lies between 10 and 30 per cent, depending on how much development was done by Paramount on the original idea. Jason, being the company's whizz kid, is paid a few but he's not rolling in money.

So Jason's had to put aside ideas (if he ever had them) of quick bucks on the Eugene

Evens scale. He probably works hard and has to undergo the additional strain of changing from the Vic to the 64. "That was the make-or-break period of our relationship," remembers Hornham. "We tried to give him a lot of backing and spent a great deal of time at his house."

While Jason was struggling with the 64 version of Outback, Hornham suggested he take a break and work on something else. That was how Megawatt appeared - a somewhat classier version of those space-shipping zapping games. And like Jason's other games, it has received good reviews in the computer press. It's also become Paramount's best-selling product with sales of 60,000 expected by the end of April.

Getting noticed

A string of good reviews have doubtless been a boon to Paramount. But despite Jason's talent, if those games don't appear in the shops the customer won't be able to buy them and Paramount makes no money. But

there's the paradox that dealers won't stock you unless somebody else is stocking you. So how does a small company get itself noticed and its products on the High Street?

One answer for Paramount might have been mail-order. But Hornham recognises that the bottom has fallen out of that - and so has customer confidence. Too many software houses in the past have 'forgotten' to meet their customers' orders.

In any case, you don't sell many games that way. And he wants to sell a lot of games. So Hornham has a sales force of three; they travel the country visiting as many dealers as possible. That's backed up with an advertising campaign in the computer press.

"At the beginning, we got the usual 'what, another one?' response from dealers. But when they actually see our products demonstrated, they invariably stock them."

With stocks in plenty of dealers' shops, Hornham was armed with more clout with which to contact distributors and

Bookkeeping for the Cash Trader on the CBM 64

- * Purchase day book
- * Weekly takings summary
- * VAT Account (Retailer schemes A & B)
- * Trading Account
- * Profit & Loss Account
- * Balance Sheet

FREE 14 DAY TRIAL OFFER

Send us a cheque for £25.00 as a deposit and we will send you a demonstration cassette or disk, the user guide and specimen reports on 14 days trial.

If you wish to buy the live system, return the demonstration cassette or disk (keep the user guide) and a cheque for the balance of £64.70 and we will send you the live cassette or disk and our VAT invoice.

Excellent little manual - very good for the cash trader!

Commodore User, March 84

Alternatively, if you return to us the cassette or disk the specimen reports and the user guide in good clean condition we shall return £20.00 to you retaining £5.00 to cover our handling charges.

Receipt by us of your cheque for the £25.00 deposit will signify your agreement with these conditions. Please state whether you require cassette or disk.

PRICE £78.00 +VAT

QUICKCOUNT LTD

15 NEEDLE CRESCENT
LONDON NW4

01-202 5486

we can
be made at
Special Price

A QUALITY LIGHT PEN

SUPERIOR PERFORMANCE

- Absolutely insensitive to ambient lighting
- Responds to different colours and screen intensities without any adjustment of TV or monitor
- Red LED readout showing that data is available
 - Switch for program control (allows pen to approach this screen without airless data capture)
 - All features are Program accessible



SUPERIOR PROGRAMS

- Good Documentation
- Tape storage of your work
- User routines provided on tape and printout
- Freehand drawing program
- Library menu drawing program (define your own library of shapes)
- Example programs illustrating uses of the pen and its features

£25 inclusive of P&P NOW ALSO FOR CBM 64

Please state DRAGON BBC or VIC 20 when ordering
Send cheque or PO for £25 to

Dept. CI Datapen Microtechnology Ltd, Kingsclere Road,
Overton, Hants RG25 3JB, or send SAE for information sheet.

NOW ALSO AVAILABLE FROM GOOD COMPUTER STORES

Datapen Microtechnology Limited

Can you afford to write for anyone else?

ocean

**Leaders in Computer Games require
programs and programmers**

1. Original game programs for the Spectrum or Commodore 64 or Amstrad 486 or Z8000 - Arcade, Strategy or Adventure. We pay top royalties or tailor a contract to suit your needs - WorldWide sales ensure the best possible deal.

2. Programmers to work in 280 or 6502 assembly language for contract work or translation coding - best rewards.

ocean

Write or phone in confidence to: Software
Development, Ocean House, 6 Central Street,
Manchester M2 5NS 061-832 8633

SOPHISTICATED GAMES FOR VIC 20

VIC CRICKET Realistic game of skill and luck with all the major rules of cricket correctly interpreted. Full scorecard, printer and game save facilities. Needs 16K expansion. **£5.99***

LEAGUE SOCCER League championship game for 2 to 22 teams/players. Automatic fixtures, full action commentaries, match facts. League tables, results check, postponed games, etc. Non league matches also playable - the VIC will even make the cup draw. Printer and game save. Needs 16K expansion. **£5.99***

WHODUNNIT? Twelve guests have gathered for drinks at Murder Manor. However one of them has more than drinks on his mind. Thrilling detective game for 1 to 6 players, with genuinely different murder every time. You can even re-name the suspects! Needs 8K expansion. **£4.99***

TOP OF THE POPS Money making game about the music business. Make your own records and see them climb the chart. Printer and game save facilities. Needs 8K expansion. **£4.99***

VIC PARTY Contains MASTERWORD, A DAY AT THE RACES, GAME X (Strip Poker), and CONSEQUENCES. Four games ranging from the serious to the ridiculous. All good fun - nothing offensive. Needs at least 3K expansion. **£5.99***

Available from

SOPHISTICATED GAMES,

Dept. CH, 27 Queens Road, Keynsham,
Avon BS18 2NQ. Tel 02756-3427

CBM 64 VERSIONS COMING SOON

WRITE FOR DETAILS OF OUR FULL RANGE

*P&P free (U.K.) only. All games sold subject to our conditions of sale, which are available on request

The Commodore User Profile

one of the national chain-stores. Of course, that's where the big sales start, distributors buy in bulk and guarantee to get your tapes into a large number of shops - on a national basis. "Safeway, Piccadilly and Webster's now distribute us. We're in Books and Members too, but to get there, we had to bombard them with reviews, literature and reports from customers."

There's a price to be paid for selling in bulk to chain-store or a distributor. Both expect large discounts, the latter taking as much as 30 to 60 per cent of the tape's retail price.

Paramount's games are selling well. But both Hershman and Chapman realise that to be successful, their games must continue to be original and they must push further towards the computer's technical limits.

"We're constantly looking at other people's games, especially those new on the market, to assess the State of the Art." Benham says that recent games diverge from large concepts like left him cold. "Taskset is the only other software house we're watching closely". That company happens to specialise in games for the 64 (Super Pole and Jammin' now appear at the top of the 64 pop-lists).

Developments

Paramount is characteristically keen about its new games developments. Apart from acquiring someone to rewrite existing games for other machines, the Spectrum in particular, it's looking for what Chapman calls "vastly more complex games". What that amounts to he is loathe to reveal, except "we're developing a Commodore 64 game that uses 48K, about 7K more than the machine's usable RAM, by getting into its dark corners".

Leading such a lengthy game on tape will probably tax your pocket. So providing games on floppy disk, as the likes of Isis Baber and Audiogenic are already doing, may be a good (but necessary) idea. "At present it costs more and we'd like to pass that on to the

customer. But we will be manufacturing disk-based games by the end of this year."

Will the games market in its present form last that long? Both Hershman and Chapman have strong views on that. "Leisure time is going to increase," observes Chapman (he doesn't like the word "unemployment")

so far, and it's not worth selling on the basis we've seen. It will take us a long time to dig out and produce our own. And, at present, we just haven't got the time." It's a matter of priorities, Hershman would rather open up overseas sales of existing products than diversify into uncharted waters.



"and people will require something to do that is not only leisure but constructive". That's why they prefer "leisure" to "games" as a description for their wares.

Over to Hershman: "We realise that the market is diversifying into home and educational software. But we're not impressed with what's available

Whatever the software, though, Paramount is staying with the Vic and 64 as its main machines - and probably with any future machines Commodore decides to launch. The Vic is already beginning to suffer from a scarcity of new games. But Hershman is sticking with it, and says his Vic games are selling well; "we will continue to

produce games for the Vic because it's got such a large user base." And the 64? "It's absolutely first class - ideal for what we want."

Master plan

And what Paramount wants, according to Hershman, is to be in "the business of winners. Unlike the rest, we don't produce one good game and a load of bad ones. We have only eight games and they're all good". Which is for you, the customer, to decide. But what he's saying is that going for quality rather than quantity makes better business sense.

Hershman's idea of winning is linked to his idea of promoting and managing personalities.

Two or three of our programmers will become Big Names - one of them will be Jason Benham. He knows that everything we said would happen has happened." Not too surprising since Hershman now manages Jason's affairs personally.

"As of now", he enthuses "Jason will be getting gradual and co-ordinated exposure in the media as a whole, in magazines, radio and ultimately on television". But is Jason ready for the likes of Terry Wogan? And what will he actually do under the bright lights? Hershman has no doubts on either count.

"We don't want to push him out too soon. So we've gradually involved him in a pseudo-social life and people have noticed that he's coming out of his shell. Outback and Megawatt have also given him a great deal of confidence. You can't promote a guy unless he's going to be able to do something - we see Jason contributing to computer magazines and computer programmes on both radio and TV" - all this, he harkens to add, with complete parental consent.

In the shortest space of time Paramount has existed, Hershman has laid the foundations for his Plan and he's confident that the youthful Jason Benham will fulfill the promises made to him. "Jason's got the ability to understand exactly what I'm after; he has the original concepts but he can also listen to what I'm saying. As a result, he's achieved what I consider to be the ultimate in programming." So Jason's future stardom is assured? In any case, whatever the success he grabs, it looks as though he'll achieve it the Hershman way.

Basic Style – Program Evolution

by Jim Butterfield

Sometimes you see programs that are so crisp and neat that you wonder how the programmer's mind can be so orderly. The code comes out in an elegant incisive style. Every line zeros in on exactly the right thing to do.

How does a programmer develop such a style? Why can't you write like that? Sometimes a lowly hacker can feel inferior when facing such immaculate programming style. Yet the code you see is often a matter of evolution – rewriting and tidying up. It's not always written that way from the beginning.

I have been accused of writing 'squeaky clean' programs. It seems to me that you might like to see how my mirky first programs get reworked and tightened up into their final version. It seems to me that in some ways, programming style isn't what you write (at least at first) – it's knowing what to look for when you clean up.

I need to do an almost trivial job – list a file from disk to the printer.

I had a minor extra to do. I wanted individual pages, so that the lines needed to be counted. I needed a title on each page, and at the end of the run, for the sake of neatness, I wanted the printer to eject the page.

It's not a demanding task, but I'd like to show you how I went about it. In particular, even a simple job like that can be revised and tightened up extensively.

Here's my first program. I'll talk my way through the listing.

```
100 OPEN 4,3
Open file number four to the screen. Why? So I can send the program's output to the screen and see that it's working right. After the program looks good, I'll change the above line to OPEN 4,4
```

```
105 OPEN 1,3,"CONTROL"
```

That's my input file to be listed

```
110 REM start of page
120 FOR J=1 TO 2: PRINT #4:L=L+1 NEXT J
130 PRINT #," title "L=L+1
140 PRINT #4:L=L+1
```

This prints the page title. I know I'll come back here for each new page, so I'm placing a REM statement here to mark the place I rigorously add. To the line count, L, each time I print a line.

```
150 INPUT #1,A$;SW=ST
170 PRINT #4,A$;L=L+1
```

Here's where I input from disk and output (to the screen first, later to the printer). I need to save the value of ST (the status variable) so that later I can check to see if this is the last line from the file. ST will be changed by the PRINT# command, so I save its input value in variable SW.

```
180 IF L<62 GOTO 250
190 IF L=66 THEN L=0;GOTO 250
200 PRINT #4:L=L+1;GOTO 190
```

If I have printed the maximum number of lines desired, I want to eject the paper by printing until the line count L equals 66. Since each page has 66 lines, I'm now at the start of the next page and can set L back to zero.

```
250 IF SW< >0 GOTO 300
260 IF L=0 GOTO 110
270 GOTO 150
```

If I'm at the end of the input file (SW=0) I'll go to line 300 and wind things up. Otherwise, I want to go back.

Here's a cute touch – perhaps too cute for some tastes. Variable L can only be equal to zero if I've just ejected a page. If not, get another line from the input file starting at line 150.

```
300 IF L< >0 GOTO 190
```

Here's a super-cute trick. I pondered this one for a while, since it's almost too clever; that sort of thing can trip your coding up. Here's the objective: if we're finished, but the paper hasn't been ejected, get back to line 190 and eject the paper. The coding will come back here again, but this time variable L will be zero and we can finish the job by closing the files.

```
310 CLOSE 1
320 CLOSE 4
```

That's it. It's really rather messy coding. It works, and for a temporary job that's all we would need.

But it doesn't 'feel' right. The code feels messy; it seems to jump around and I don't get a feeling of smoothness in the program. It's time to pick at the coding.

First revision

The first awkward spot is around lines 190 and 300. The code to eject the paper works but looks clumsy. Besides, we call it twice (once at 62 lines, and again at end of file).

I have feelings about this part of the code, too. It's a 'must' to do a particular job. I would feel better moving it to a separate subroutine where it can stand out as an identifiable action. Sometimes I extract code into a subroutine and then move it back later; it helps me identify the 'modules' that make up the program.

Let's move the eject routine to a subroutine at line 500, clean it up a bit, and see what we get.

We can see that the GOTO 250 on line 190 is now redundant since we'll go there anyway. But we have other things to do. We're still trimming the program, and have some distance to go yet.

Taskset & commodore 64

We're only writing games and we're only writing for the 64. Rely on us to bring you the greatest games, the greatest concepts and the greatest value.



The complete deep space saga. A radical joystick action can bring inspired flexibility and a horrific kill-rate. The outstanding graphics include highly detailed craft and lots more than eight sprites at once. A full music and effects sound track accompanies the action. All these features combine with player options and a top 20 hi-score table to set new standards in hi-tech slaughter.



A brand new character game. Poor old Bozo, all he has to do is to get home after a night out with the lads. That's easy until a wobble becomes a lurch and a stagger. Later into the night, all rules go out of the window as he disbelieves what's happening in front of his blood-shot eyes. An epic journey with ultra-smooth graphics and sprites which run rings round normal games.



SUPER PIPELINE

Keep the pipeline open. Foreman Fred and Plumber Pete have the work cut out. The evil ladderman drops metal wedges to plug the pipeline - and only Pete can fix 'em. Pete truss Fred to defend him against the six legged Venusian pipe spiders and the hard case lobster while he knocks out the plugs and restores the flow. Full accompanying music and effects options and hi score table.

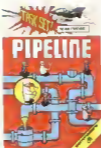
JAMMIN'

Unlike anything else, a totally musical game yet highly colourful. Guide Rankin Rodney through the top 20 mazes - each with an interactive rock sound track. Gather the instruments and make a band but watch out for bum-notes, dischord and that most deadly effect - distortion. If you've never heard the full music capabilities of the 64 grab an instrument and join the band.

COSMIC CONVOY

Just surviving is not good enough in this giant convoy. Control three fighters at once to defend the huge transporters as they ply between the planets. Only those transports reaching planetfall will gain galactic credits and no-one expects promotion for losing the

All available now on cassette or disk.



TASKSET LTD - The Specialists

Naturally, everything we've written for the 64 is available on either cassette or disk.

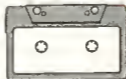
Selected titles available from W H Smith, Boots, Manx and all good computer stores.

Major distributors include Microdealer UK, Wabacus, Centrow and P.C.S.

All games are the exclusive copyright of Taskset Limited. All rights are reserved. It is a criminal infringement of these rights to copy or otherwise.

© MICROMOVY TASKSET LTD 13 High Street, Bridlington YO16 4PR, (0262) 73798

cassette



£6.90

each

disk



£9.99

Taskset Ltd

13 HIGH STREET BRIDLINGTON YO16 4PR

ACCESS ORDERS (0262) 73798 24 HOURS

Dealer enquiries welcome (0262) 602668

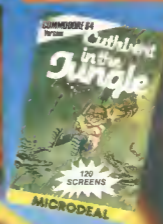


NOW AT LAST!

Cuthbert

ON THE





Commodore 64



Yes at last those fantastic top selling games for the Dragon are now available for your Commodore 64. Avoid those Marauding Moronians in "Cuthbert Goes Walkabout", Fight for survival in "Cuthbert in the Jungle" or plunder the Moronlane planet in "Cuthbert in Space". These great games are a "must" for your software collection.

CASSETTE £8 EACH DISK £9.95 EACH

Mail Order Sales from
Microdeal Mail Order 41 Truro Rd,
St. Austell Cornwall PL25 5JE

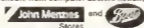
Credit Card Sales    
Phone 0726 3456



Dealers Contact
MICRODEAL DISTRIBUTION
0726-3456
or **WEBSTERS SOFTWARE**
0483 62222

MICRODEAL

Selected Microdeal Titles available from computer dealers nationwide or from larger branches of



```

100 OPEN 4,3
105 OPEN 1,0,3,"CONTROL"
110 REM start of page
120 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
130 PRINT#4," title "L=L+1
140 PRINT#4:L=L+1
150 INPUT#1,A:SW=ST
170 PRINT#4,A:L=L+1
180 IF L<62 GOTO 250
190 GOSUB 500:GOTO 250
250 IF SW<>0 GOTO 300
260 IF L=0 GOTO 110
270 GOTO 150
300 IF L<>0 GOTO 190
310 CLOSE 1

```

Digging deeper

Around lines 250 to 270, we jump around a lot: we have one jump forward to 300 and two jumps back to 110 or 150. The logic seems scattered.

I have a thing about loops. I like to see them neatly nested, with short jumps entirely within longer jumps. It might even be summarized as a rule-of-thumb: where possible, make short jumps as short as possible.

Using this rule, I want to get the loop back to 150 into logical order first. Then we'll work in the longer loop to 300 and finally the forward branch to 300. We'll need to expand the logic using an AND operator, but that's not too hard.

As the coding is written, certain logical things start to fall together. For example, we don't have to GOTO forward to line 300... when we're finished writing the two loops, we'll fall into 300 naturally. (Naturally seems to be a key word in how programs seem to come together as you tighten them up.)

We can also tighten up the page eject conditions. If we write line 180 correctly, there will be no need to go back to get a page ejection. One option would call the subroutine at 500 twice. But if we think of what our objective really is at line 180, we can do it all correctly the first time through inverting the logic and adding an OR connective does the trick nicely.

Look at how far the original program has come.

```

100 OPEN 4,3
105 OPEN 1,0,3,"CONTROL"
110 REM start of page
120 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
130 PRINT#4," title "L=L+1
140 PRINT#4:L=L+1
150 INPUT#1,A:SW=ST
170 PRINT#4,A:L=L+1
180 IF L>61 OR SW<>0 THEN GOSUB 500
190 IF SW=0 AND L>0 GOTO 150
260 IF SW=0 GOTO 110
310 CLOSE 1
320 CLOSE 4
330 END
500 FOR J=L TO 0:PRINT#4:NEXT J
510 L=0:RETURN

```

This is pleasing... but we can do even more. The repeated SW=0 test in lines 250 and 260 still irks a little: it seems clumsy. The whole business is tied up with whether to print a title or not. Is there a better way? Could the test of L>0 be somehow shuttled up to the top of the loop instead of sitting at the bottom?

While we're thinking about it, the whole business of printing a header is really a module. We must do the whole thing: title and all, or nothing. If we move it out to a subroutine, we might see the logic flow more clearly. Let's do it and work on the logic flow. We end up with this.

```

100 OPEN 4,3
105 OPEN 1,0,3,"CONTROL"
110 IF L=0 THEN GOSUB 500
150 INPUT#1,A:SW=ST
170 PRINT#4,A:L=L+1
180 IF L>61 OR SW<>0 THEN GOSUB 500
260 IF SW=0 GOTO 110
310 CLOSE 1
320 CLOSE 4
330 END
500 FOR J=L TO 0:PRINT#4:NEXT J
510 L=0:RETURN
600 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
610 PRINT#4," title "L=L+1
620 PRINT#4:L=L+1
630 RETURN

```

Look at the main code from lines 100 to 330. It now seems tight and concise like a finely tuned instrument.

Both subroutines at lines 500 and 600 are called only once. If it seems important, we could put them back into the main coding stream. But I'm happy to see them as clearly isolated modules. At this stage I would add comments (line 499 REM PAGE EJECT and line 599 REM TITLE PAGE) to nesten things up.

Moral

First: what you see published is not always the first coding idea that popped into the author's head. The programmer is not always smarter than you. But more time has been taken grooming the program into its final shape. When many people are going to read your code, you like to take a few extra pains with its appearance.

Second, don't be afraid to revise your programs, even if they work correctly. Sure, a one-shot program often doesn't warrant picking over, use it and forget it. But sometimes the exercise can reveal almost accidentally powerful and effective ways of coding.

Third, 'style' isn't an inborn talent that some people have and some don't. You learn it as you go. Some things you will discover for yourself, and others you'll pick up by looking at other people's coding.

The odd thing is that we instinctively recognize better coding when we have written it. You may not know exactly why, but you often feel good about a certain piece of programming. Usually, it's because it has 'style'. But remember that style isn't a matter of luck. You can get it by working for it.

COMMODORE REPAIRS

Vic-20 - £12.50	CBM 64 - £15.00
1541 - 1540 floppies -	£20.00
2,3,4 + 8000 series computers -	£40.00
2,3,4 + 8000 series floppies -	£40.00

UPGRADES

1541 - 1540 -	£40.00
2,300 - 4000 computers -	£70.00
2,3000 - 4000 floppies -	£97.50

Send your machine with a brief note describing the faults to:

Computer Repair Services,

37 Linden House, Common Road, Langley, Berks SL3 8TT. Phone: Slough (0753) 48785.

FIELD SERVICE

40 miles radius of Slough and Business Systems, 'phone for further details.

SINCLAIR SPECTRUM

Spectrum Computers -	£10.00
Upgrades series 2 + 3 -	£21.50

the above prices are exclusive of P&P.

COMMODORE 64 DATABASE

DATAFILE

Potential options include: Print all/select, records delete, amend, save, load, copy, alphanumeric sort, user defined fields, memory check, total numeric fields, multi-field interrelational, global and between limits searches etc. Fully Menu driven with comprehensive easy to use instructions. Disk and cassette fully compiled. (Can be used with 1515, 1525, 1526, CP 100VC, MPS 801 printers and 1520 printer/plotter if required)

Outstanding value: cassette £7.45, disk £10.25 fast delivery by first class mail. Send cheque/postal order to:

A+C Software, 51 Ashtree Road, Tivdale, W Midlands B69 2HD

CARTRIAGE CITY COMMODORE 64 CARTRIDGE RENTALS

- ★ Choose from a rapidly growing range
- ★ Descriptive catalogue
- ★ Yearly membership only £5
- ★ Hire rate from £1.50 for 10 days
- ★ First hire FREE
- ★ Big discounts on software and hardware
- ★ Monthly Star Program Offer

Large SAE appreciated for details

CARTRIAGE CITY, Dept. C,
25 GAITSIDE DRIVE, ABERDEEN AB1 7BR.
or phone: (0224) 37348

Y-E-S Vic 20 & 64 COMPUTERS

SALES & SERVICE

SAY YES FOR COMMODORE
HARDWARE, SOFTWARE & PERIPHERALS

YORKSHIRE
ELECTRONICS
SERVICES
LIMITED

Coxon House,
17, Fountain Street,
Morley, West Yorkshire
Tel 0532-522181

Adult entertainment
on your computer

LEWDO!

It's new ... It's naughty ... It's a game only
friends can play.

FOR THE COMMODORE 64 - £6.95

Twilight Software, 158 King Street, LONDON W5 0QU

LEWDO! is available for under - 10s

Sumlock MANCHESTER

Commodore appointed VIC 20 dealer.
Permanent showroom-shop display.
Hardware-Software-Accessories.
Books-Service-Maintenance.

Personal computers with Personal service

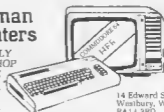
198 DEANSGATE, MANCHESTER.
TELEPHONE 061 834 4233

Everyman Computers

YOUR FRIENDLY
COMPUTER SHOP
IN WILTSHIRE

VIC PRINTERS
DISC DRIVES
SOFTWARE -
DUST COVERS
BOOKS, CARTRIDGES

Commodore 64 - THE BEST VALUE ON THE MARKET



14 Edward Street,
Westbury, Wiltshire
BA13 3BD
(0373) 864644

ATTENTION CBM 64 PROGRAMMERS!

As a new software sales company, we require your original games programs suitable for the Commodore 64. We will pay generous royalties for accepted material and will return all programs after assessment.

Games must be written in either full machine code or in a combination of Basic and machine code although exceptional Basic-only games can be considered. PLEASE SEND YOUR TAPE OR 154/1540 DISK (CAREFULLY PACKAGED) TO -

Mr G V Pettican, 106 Jaywick Lane, Clacton-on-Sea Essex, UK
(0255) 433675.



DERBY

CBM64 AND VIC20 DEALERS

We have the largest selection
of hardware, software and books
in the area.

FIRST BYTE COMPUTERS,

10 MAIN CENTRE,
LONDON ROAD, DERBY.
TEL: 0332 365280

TOMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wodge of priceless information and indispensable advice. There's even the odd useful tip as well.



Dear Tommy, I am at the end of my tether: it seems that I am usually unable to get an answer from Commodore to my problem. I have a Vic-20 and a Brother CE40 Electronic Daisywheel Typewriter plus its IF50 interface and its CA50-5 cable set (the machine accepts RS232 or Centronics). The lead has a D-type 25-pin plug; the Vic-20 is RS232 to drive my word processing equipment? Why don't Commodore tell us more about the RS232 of the Vic, or is it all a filthy lie?

Before you connect a printer to the Vic using an RS232 link, you need an RS232 adapter for the Vic. Surprised? Well, the Vic does not really have an RS232 port - it's so-called 'RS232' port is software-compatible with RS232, but it needs some extra hardware to convert the Vic's signals to the different voltage range required.

Back (among others) does a very good interface. Unfortunately buying one of these means your problems have now only just started, because very few hardware manufacturers implement the complete RS232 specification, except for full communications devices like modems. Instead, each company takes what it considers to be a reasonable subset of the standard. The result? Trying to connect so different devices, each using a different subset of full RS232, can be an absolute nightmare.

In addition, some printers use special characters sent up and down the line to tell the computer when they are unable to accept any more data (printers are very much slower than computers and so the Vic needs to stop every so often to allow the printer to catch up).

Now, the cable you already have may well work, if not, hopefully, the

interface manufacturer may be able to give you the required connections if you can send him the details of the Brother Interface. But don't expect it to work first time, unless you can find somebody else who has successfully connected the same printer to a Vic. It can take even an expert some fiddling to get an RS232 link working properly, and trying to do it by post is much more difficult!

Dear Tommy, The display on my 64 is flickering whenever the computer is parked in an INPUT or a WAIT or similar endless loop. Small twinkles appear around characters like 'D', 'E' and 'F', although the rest appear normal. But if the character set is moved to RAM, all characters appear normal and without flicker. What could be the cause of that?

The 64 also seems to have a strange bug. Press both cursor control keys permanently and then press the left-hand shift key. You should then be able to observe some spaces on the screen, if yours has the same bug.

The first problem sounds like a hardware fault, but it is very difficult to think of a cause without having the machine look at it sounds as though maybe the character generator is borderline. It is unlikely to be a serious problem though.

Your second point is something I had not noticed before - presumably it is something to do with the keyboard decoding on the 64 special characters sent up and down the line to tell the computer when they are unable to accept any more data (printers are very much slower than computers and so the Vic needs to stop every so often to allow the printer to catch up).

Now, the cable you already have may well work; if not, hopefully, the interface manufacturer may be able to give you the required connections if you can send him the details of the Brother Interface. But don't expect it to work first time, unless you can find somebody else who has successfully connected

the same printer to a Vic. It can take even an expert some fiddling to get an RS232 link working properly, and trying to do it by post is much more difficult!

Dear Tommy, I have been trying to write a 'Monopoly' program for my 16K Vic. The information about each street, rent, price of houses etc is stored in DATA statements - for example:

```
10 DATA 200.0,0.0,0.0,0.0,GO
20 DATA
    0.2,10.30,90,160,250.50, OLD
    KENT RD
```

These lines are perfectly legal as far as I can see, but when I run the line

```
1000 READ
    D(1),P(1),P(2),P(3),P(4),
    P(5),P(6),S(1)
```

I get a SYNTAX ERROR. Why?

Now for something completely different. When I run the following program a STRING TOO LONG ERROR in 20 is detected, even when the string length is only one character long:

```
10 OPEN 1:1,6,"DATA"
20 INPUT "1,RE,SE,T,C,ETL"
30 CLOSE1
```

This has puzzled me: the manual says the maximum string length is 255 characters.

And finally, can you tell me the machine code instructions needed to find a random number?

The SYNTAX ERROR in a DATA statement is caused by trying to READ a character value into a numeric variable. The lines in your letter look all right, but are you sure you haven't got a letter 'O' instead of a digit '0' somewhere? It is very easy to miss out one value in a string of DATA items, so that the READ statement comes to an alpha character while it is still looking for a numeric one.

The maximum length which can be assigned to a string is indeed 255 characters, but the maximum length which can be INPUT is only 80. If you are inputting several values with one INPUT statement,

each value in the record must be separated on the tape by a comma. A typical line to write this data would be

```
100 PRINT AS," ",RS," ",CS
```

To produce a random number in assembly language use one of the following calls as necessary:

```
JSR E098 equivalent to RND(0)
JSR E09E equivalent to RND(1)
JSR E0D0 equivalent to RND(-1)
```

In each case the random number in the range 0 to 1 is left in normal floating point form from \$28 to \$3F.

Dear Tommy, Could you please tell me if it is possible to get programs written on the Vic to run on the 64. I am considering upgrading to a 64 and I am wondering whether I could adapt the programs I have written on the Vic without too much difficulty.

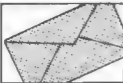
It all depends upon how you have written them. Basic programs should run without too much trouble (provided you have not filled them with PEEKs and POKEs) because the two Basics are identical. The major change here is to accommodate the fact that the 64 has a 40-column screen, so you will want to alter your screen displays to make them look nice with a different format.

It is the PEEKs and POKEs which, as always, cause the problems. Fortunately Commodore have gone to some lengths to make your job as easy as possible here. POKEs into locations below 1024 are likely to be unchanged. The screen memory now starts at 1024, and the corresponding colour area is \$5296.

The procedures for high-resolution graphics and sound have changed completely, though, so you will have to look up the articles in *Commodore User* dealing with those, but as the 64 is so much more powerful in these respects you would probably want to modify your programs anyway.

Write away

This is your page: normally we write for you, but here we listen. Feel free to let us know what you think - about the magazine, about Commodore, about suppliers, about life, art, the meaning of existence or whatever. We don't print everything we receive, of course, but anything that might be of specific relevance or general interest will make it to these pages.



About ANIK

In your February issue you carry an advertisement for Anik Microsystems Software, the advert says your games will be sent within 48 hours. I think you would like to know that in answer to a similar advertisement I ordered Yaboo on 10 October 1983. I see from my bank statement the cheque was cashed on 14 October.

As I did not receive the software I wrote to Anik in December but as yet have not received a reply. Since Christmas I have telephoned five times; three of the five times a youngster has answered and said someone would ring back - they never did. On the other two occasions a woman answered, the first time she said it would be attended to the following day - it wasn't. The next time she said she remembered passing on my message to Mr Andrews and she would tell him again.

It is now nearly five months and my letter and telephone calls have been ignored.

I think you should know that the advertisement your magazine is carrying only results in people losing money instead of receiving the goods they ordered.

R.A. Riste, 43 Easter Road, Kilsnoe, Forres, Morayshire IV36 6FG

This is only one of a number of letters we've received about Anik. Reluctant to condemn anyone without giving the chance to respond, we have been trying to get in touch with this company by letter and phone for two months - with no effect.

We are not accepting any further advertisements from this company. We advise you not to send it any money. And

anyone who has lost money by ordering games from Anik is recommended to drop into a Citizens' Advice Bureau and ask about Small Claims in the County Court - a cheap and easy way of taking a defaulting supplier to litigation.

Devaluation

I read with interest WJ Howard's remarks concerning the devaluation of the Vic and your reply.

I bought my Vic in January 1983 after reading your December 1982 article which had influenced me a great deal. I had felt that with the possibility of this (now mythical) offer I shouldn't lose much. I went on to buy all Vic expansion - including expansion board and printer - feeling that if a company was prepared to consider its customers they had a right to further support.

My naïveté has been a little costly on my pocket and I now find that to try to sell entails almost giving it away. My decision is to hang on to it and save for a different make of machine. I shall certainly not buy Commodore products again. Its sales tactics over the Vic have left much to be desired.

My attitude to your mag over this experience was also wary and when it became more and more obvious I began to groan and decided enough was enough; however this month's issue has restored my faith somewhat and I am digging into my well-worn pocket to see if I can find enough pennies to make up £12. I also find your mag invaluable for software addresses, as living outside the UK obtaining software is sometimes a bind.

Which brings me onto the request. It is possible to review more useful software than the multitudinous games? Or better still, as well as? I have at present the Home Office word processor which for its price is great value; however, I could do with something more sophisticated. I would also like a spreadsheet. I realise that what I am after are business applications, is there any hope for my little machine? (Should you have covered this last request my

apologies for while I was dithering on whether to renew or not to renew I missed several copies.)

Oh, just to round off, can anyone tell me why when using the Home Office with the 1825 printer does the whole shebang hang up on me on the second copy? It happens usually after making amendments to the master copy and justifying again.

Mrs V Yates, BFPO

Dear old USA

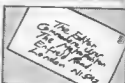
Being completely new to computing I rely heavily on reviews of games software before making a final choice for my 64. After trying various mags I have settled for buying Commodore User regularly, so could we please have more games reviews?

Now to the real reason I'm writing. Some software houses are advertising American games software. What is baffling me is why the games are so expensive. They range anything from £20 to £40 per cassette. Why? Is it because their games are far superior to our own British games or more complicated? How do you know what you are buying? Having not seen a review of any American game, I for one would never part with so much money to find out!

So could you please explain the reason behind such high pricing of games software from the USA?

M.J. Wiles, 197 Kenilys Way, Coedevra, Cwmbran, Gwent, South Wales NP44 7LB

Suppliers tend to attribute the price variances to import duties, the risk of buying large quantities at a time, and the uncertain exchange rate (if you order \$3,000 worth of something when you expect it'll cost you £2,000, and then the rate changes so that it'll cost you £2,800, it can make a big dent in your profit plans). But in general we agree - US games in Britain shouldn't be so expensive. After all, British software in the States isn't marked up proportionately.



Simply good sense

I don't ask you to print this further correction to the review and subsequent comment on our Simply Write program, and I don't want to upset a reviewer who will, we hope, review more of our products in time to come but I do feel that your heading and Chris Durham's reply to my letter in the February issue imply that I am a liar. I am not happy about that.

Chris Durham's "...I noted a number of changes some of which are additional calls on the error checking routine" is a contradiction of my letter and a blatant mis-statement of fact. If you are going to allow your own staff to have the last word in such a matter then you have a responsibility to see that what they say is not derogatory or misleading. In fact, the only change made in the error checking in the correct version sent after the review was that an "IF DN < 4 THEN", which had somehow been lost in the particular master used, was replaced WITHIN the error checking routine before a RETURN. I enclose a letter from one of our many satisfied customers which confirms that the error checking already existed in the program, and that he was surprised to see you misleading review.

While I applaud the editorial independence that keeps reviews and advertising distinct in the majority of British magazines, I do feel that it would be a good idea if you were to check your conclusions with the producers of the goods before publication. After all, quite apart from the relatively rare occasion such as this when a bad copy is received, it is a rapidly

PARAMOUNT

SOFTWARE

for Connoisseurs with COMMODORES

COUNTDOWN

Time is important.
Accuracy essential.
Courage mandatory.
But, above all, Nerve
is the prime attribute
needed for your
mission as an agent
in the crack S.M.U.
A Superb Arcade /
Graphical Adventure.
VIC 20 8K or 16K
Expansion, Keyboard
or Joystick.

£5.50



OUTBACK

"...an addictive
game... the Graphics
are very good indeed
...there's also a lot of
very good program-
ming." Personal Computer
News, Dec 22-Jan 4 1984.

Can you use the very
sophisticated defence
set-up to beat off the
cunning Swagmen?

Pure Machine Code
Action. Fully Featured.
Superb colour and
Graphics.

A game with a difference.

Any VIC20 Joystick.

COMMODORE 64

Keyboard or Joystick.

£5.50 & £7.50

CHOCABLOC

A fast moving, pure
Machine Code action
game, with Chocabloc
our hero trying to sort
out some Real Cool
Choc Bars — until every-
thing goes crazy and the
action is on!
Arcade standard.
Fully Featured.
Excellent sound and
graphics.

VIC 20 8K or 16K
expansion,
Keyboard or Joystick.

£6.50



MEGAWARZ

Where does your fantasy
go when your mind leaves
your body?

Megawarz will take you
there you can be sure.

High resolution, multi-
colour graphics.

Sprite graphics.

Synthesound.

Pure Machine Code

action.

Arcade Standard.

A magical planetary

trip.

COMMODORE 64

Keyboard or Joystick.

£7.50



JOGGER

Truly a jogger amongst
joggers. If you have trotted
with the rest, now run with
the best.

Machine Code action.

Superlative sound.

Creative Colour.

A quality programme

from Paramount.

Any VIC 20. Joystick.

£5.50

Selected titles are available
at **BOOTS, JOHN MENZIES,**
major department stores and
computer stores nationwide.

Dealer, export and
distribution enquiries to
Bob Horsham

(Paramount)

Tel: 0642 604 470 (day)

0642 316 211 (night)

Authorized distributors.

Centrosoft Ltd. - Tel: 021 520 7591

Tiger Distribution - Tel: 061 420 8808

Plommet Ltd - Tel: 0924 264412

Websters Software Ltd - Tel: 0483 63222

Mail order — despatched by
return, post-paid. Please
make cheques/P.O.s payable
to:

PARAMOUNT SOFTWARE

67 Bishopston Lane, Stockton, Cleveland, TS18 1PU.

CHOCABLOC £6.50 ☐ Name.....

OUTBACK £5.50 ☐ Address.....

OUTBACK 64 £7.50 ☐

COUNTDOWN £5.50 ☐

MEGAWARZ £7.50 ☐

JOGGER £5.50 ☐

I enclose cash/cheque/P.O. for £.....

Overseas orders please add £0.50 per item

CU JUNE

changing market. Continual tweaks and improvements are made to software by companies trying to give their customers good value, and one frequently sees products slated for shortcomings which have already been put right, or for not having some feature which has been added since the review copies went out. Also, this lack of communication with the supplier regarding problems is quite uncharacteristic of the situation our users find themselves in, as borne out by the second customer letter attached. I should add that this customer's problem is after some years of using our software, and has only arisen on his changing equipment.

Genuine user reviews would also be a decided step in the right direction. We get very irritated by reviews of programs (not our programs!) in which the reviewer complains that the program does not have this or that nice feature found in some other program, or has only ten thousand variations instead of the ten thousand three hundred and seventy one of program X. Specialists seem to find it hard to understand that there are many users who want fewer features, not more, as long as they are the right features. All programs are based on a set of compromises, and few magazines take into account whether a program has been properly balanced for the group it is actually aimed at, or how satisfied actual users are. It is easy and mindless to go on adding new features to a program. Knowing where to stop before it gets too complicated for the ordinary user to enjoy using it is a grossly neglected part of the skill of programming.

Too penchant for complexity and novelty in software is clearly related to that attitude of mind that makes magazines treat the latest as the greatest, so that thousands of ignorant people rush out and buy a theoretically better machine that has no software, no peripherals other than on paper and no background of user expertise or documentation. Computing for some people is not a lot of guesswork, but a simple wish to get on with various jobs more efficiently.

Misleading reviews, whatever causes them, do not hurt the

product, they also hurt your magazine. Every user of Simply Write who reads your review knows that it does not properly describe the program he or she uses, and each will view with some lack of confidence your future reviews of other products. Every reader who did not know the program has been to some extent put off buying it, which means that our advertising in your magazine may achieve less over the year than the same amount spent in some other journal. We would not be so crass as to threaten to withdraw our advertising, or even to want to do so after such a long and co-operative association but we cannot ignore comparison of returns when we are planning future outlay. We know also from correspondence on the subject that your review was directly responsible for our not receiving a re-order from a foreign company whose last order amounted to over £1500, as well as anxious letters from other foreign distributors who have been happily and profitably selling our products for months past. We should have to be pretty thick-skinned not to feel upset about that.

Brian Tregar, Simple Software Ltd,
15 Havelock Road, Brighton,
Sussex BN1 6GL

Systems of romance

Strange this feeling, as the computer age has beamed up its feeling that as an intricate part of life on this planet I have been given the right to own such power, lying at my very fingertips just under the keyboard but a brain more complicated than most human can comprehend.

Yet that power is only intrinsic, the real power remains in the biological organism of the computer which designed the close running companion the microprocessor, that of the human brain, a conglomeration of thinking power resulting in the ultimate of man's tools, capable of guiding him even into deep space.

Now that I am part of this System of Thinking, I am bewildered at the way it has changed and is continuing to change the society we live in. I feel that every time I mention to friends and colleagues that we (wife and daughter included) have acquired one of those dark mysterious machines, their view of us changes. The usual comment being "Oh I don't understand those things, what do they do anyway?"

As we all know computers are like dumb waiters, they can't do anything by themselves, without a

human operator putting in info". Knowing this takes away some of the awe of the swiftness of the feeling of power I get every time I key in relays at the speed of light down microscopic channels to command centres ready to obey in the right sequence, of course.

For me Walt Disney's "Trom" was more than fantasy, I thought it was in every way analogous to the computer and operators that generated the major graphics animated into the movie. The computer and the human brain is a two-way communication system intersected at the keyboard. Feed back being generated audio/visually. Are we instructed by the m/c or are we instructing the m/c? Do we as in Trom, enter the computer through the screen, the keyboard being our passport?

Meeting the new challenge for me is fascinating. The new frontiers are now in sight, dialogue from both sides continues to be understood the future, well who knows.

R Stammers, 9 Burnley Hill
Terrace, Stone Chat Shelf,
Halifax HX3 7LQ, West Yorks.

P.S. Sorry I haven't mentioned the pc or included any comments such as great type set, or keep us, the users, happy with more absorbing helpful information etc etc but rest assured as long as it, the mag, remains in the above state I'll keep buying it, ok

Endless manic miners

If there is anyone who has Software Project's Manic Miner on the 64 and is unable to get anywhere on three lives, here's the procedure to give unlimited lives.

Rewind the tape

Type VERIFY
LOAD"" ,1,1
POKE 16573,834
POKE 16572,234
POKE 16571,234
SYS 16384

It was easy enough to work this out using the Macro Assembler Package from Commodore (which is excellent). Anyone wanting to convert programs to disk, here are four tips.

Find the start and end addresses of the program just loaded off tape with

*PEEK(175)+256+PEEK(174)
(end)
*PEEK(194)+256+PEEK(193)
(start)

Save with a suitable monitor. If program lives under the Basic ROM, switch it out using the monitor by

A 02A7 LDX #336

A 02A5STX \$01
A 02ABERE
A 02AC
G 02A7

And then save it, re-load with LOAD "name",1. Also try saving the tape buffer with S"name",06,033C,06PC from your monitor.

I am starting a 64 division of a Spectrum club at Ormsdale school, dunes hall, Wombourne, West Midlands on Mondays at about 7pm, if anyone is interested in the area. We will be at the Midland Computer Fair at the NEC.

Nigel Wilcox, 56 Windsor Gardens, Castlecroft, Wolverhampton WV3 8LZ

Compiler controversy rages on

I'm not able to enter into the controversy over which 64 Basic compiler is the better, DTL or Pexspeed, since I only have experience of the former but I found Mr van Aard's letter from South Africa most extraordinary.

We have been using the DTL 64 Basic compiler in conjunction with our Cash Traders' Bookkeeping System since August - and can assure any of your readers who may have been worried by Mr Aard's letter that (provided the 1941 disk drive is functioning correctly) the DTL compiler is trouble-free.

We find that our original program which is 31K bytes long is reduced to 21K bytes. We cannot offer meaningful speed figures because in the interpreted mode our program spends 90 per cent of its time in garbage collection! However the compiled version (the only version we sell) has an optional feature whereby the V/A and net value of a purchase invoice can be calculated automatically from the gross. When the operator presses key 5, the results of the two calculations are displayed on the screen in the blink of an eyelid, quite fast enough for most people.

Arnold L. Shaw, Director,
Quick-Count Limited, 15 Needles Crescent, London NW4



Unlock Your Imagination

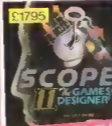
£18.95
DISC



SCOPE 64
(Tape or disc)
Not just a games designer - this remarkable product will revolutionise programming. Easy to use, supplied with bumper instruction manual - tells you everything you need to know.
PCMM000064

£17.95
TAPE

£17.95



SCOPE II
A complete update of the original award winning product - with many fantastic extras. Sprite routines - Machine code Peek & Poke. Will run your original program totally independently.
Original SCOPE owners - send in your old tape & £6.00 for a complete update and new bumper size manual.

**NOMINATED
PROGRAM
OF
THE
YEAR**

SCOPE COMPILES TRUE MACHINE CODE TO RUN TOTALLY INDEPENDENTLY
ALL THIS PLUS Free Membership to the SCOPE User's Club PLUS the unique Programmer's "Hot-Line"

not just a games designer - with SCOPE you can write truly original machine code & publish your own games!



SPECTRUM SPRITES
Today's games need sprites. Here's everything you need to know about designing and handling sprites. All in a single pack with full instructions. Handle 8 sprites simultaneously - collision detection.
It's all here!

48K SPECTRUM

£7.95



The CHARACTER GENERATOR
Another product essential for that unique and professional finish so important in today's programs. Design your own UDG's and complete character sets. 8 x 8 Pixel grid for easy design. Includes 6 specially designed character sets. Compatible with virtually all other machine code software. Big manual tells you all you need to know. Too many extras to list here.

48K SPECTRUM

£8.95



The SCREEN MACHINE
The definitive screen editor for building and assembling graphic layouts & title pages. Includes many facilities essential to produce really professional screen layouts. Supplied with big manual with full instructions.

48K SPECTRUM

£8.95



The MULTIFILE
The ultimate user friendly database. You design as many tailor made filing systems for whatever purpose. Each protected by your own access security codes. Full instructions manual includes FREE TAPE for your first file.

48K SPECTRUM

£9.95



MONSTERS & MAGIC
A classic adventure game requiring hard thinking & quick reflexes. Puzzle & solve and monsters to defend all in real time. Being modular, treasure and experience can be carried forward. The first two modules are *Tragedy, Stronghold of the Giants* and *Temple of Cthulhu King of the Undead*.
More at your peril.

48K

£6.95



BATTLE PLANET
Your mission is to fly into the trench & launch a plasma bolt into the Battle Planets. Here! You meet word Robot Fighters. Other Robot Fighters will bombard you, then the Robot commander joins the fight. He is invincible! Save Menknd!

Superb 3-dimensional graphics - only for the most competent player.
This game is one of the best.

£6.95

48K

ISPA



CLIP THE COUPON NOW AND UNLOCK YOUR IMAGINATION
Post to: ISPA Marketing Ltd., The Carbons Yard or New Road, Basingstoke, Hants RG24 0AP.
Please allow 30 days for delivery.
I enclose with me: SCOPE 64 tape SCOPE 64 disc SCOPE II
SCREEN MACHINE CHARACTER GENERATOR
SPECTRUM SPRITES MULTIFILE
MONSTERS & MAGIC BATTLE PLANET
(Amount payable to ISPA Marketing Ltd.)
Name _____ Address _____
Block capitals please

DAMS modified

Re your article in *Commodore User* March 84. Shedding light on the matter I should like to shed some light on the DAMS Pencil.

Ever since the early days of the university mainframe demonstrations I have eagerly awaited the advent of an affordable light pen. When I saw the first advert for the Pencil for my 64 I thought that my dreams had come true and duly sent off my money. When the box eventually arrived I read the manual, loaded the artist program and plugged in the pen.

Well, I was really impressed with the software but quite disappointed with the pen. My dream was shattered. When used with my Ferguson TK colour television (which I consider pretty good) the light pen's cursor seemed to fly everywhere especially to the right hand edge of the screen, and rarely where you pointed the thing.

I had a choice, do I ask for my money back? Or is there some design fault I can rectify? Now, sending it back would have meant more weeks without a light pen, and so I decided to prize it open and have a look. DAMS claimed that the 54

Pixtek was greatly improved but the following modification made it much better. (I find it hard to understand why DAMS could be so penny pinching and then blame the limitations of technology).

Modification number 1: Strip off a half inch piece of black quarter inch diameter co-ax cable sheathing. Push this tightly over the tip of the lightpen beyond an eighth of an inch projecting beyond the tip. This has several immediate advantages. Firstly you now have a soft plastic tip instead of the photo diode lens or the metal case. No worries about scratching your television screens any more, the black plastic acts as the blinkers on a horse, making it look only where you point, ie, electro-static charges

present on the TV screen do not now manage to discharge themselves into the metal case (thus preventing the cursor 'hiccups' due to them), lastly, dust now gathers around the plastic rim and not the photodiode.

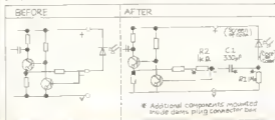
Modification number 2: It turned out that the rather inflexible flex is not screened against radio or electrostatic interference. When more than half of the flex was edgewise to the TV screen the cursor would not respond. As it happens, the flex is actually three wires of which only two are used. If one end of the wire which has been cut back is connected to the terminal marked V on the DAMS pcb, the extra screening effect of this gives a two-fold improvement allowing more of the flex to be

closer to the screen without causing problems. And a complex cure to this interference problem can be achieved by replacing the only flex altogether with standard microphone co-axial cable. When this is done the extra cable length also enables much more freedom of movement. I am using six feet of 2.5mm sheath diameter audio microphone cable.

Modification number 3: Look at figure 2. Capacitor C1 and resistor R1, now AC-couple the photodiode and transistor stages. This enables correct operation in a much larger range of ambient lighting conditions and removes the need for a dark screen border. The brightness control of the television set does now not have to be adjusted very critically, and local variations in screen brightness levels are no longer compensated for.

Modification number 4: The addition of resistor R2 in series with the existing resistor on the base of the input transistor increases the gain of the circuit, the result being that the pen works on most screen colours except dark red and large areas of black.

D.R. Donnelly, 24 Portea Close, Davenport, Stockport, Cheshire SK3 8RU



COMMODORE 64 OXFORD PASCAL



Oxford Computer Systems
(Software) Ltd
Hensington Road,
Woodstock,
Oxford OX7 1JR, England
Telephone: (0993) 812700
Telex: 83147 Ref OCSL

FEATURES

- PASCAL is the world's most popular programming language after BASIC
- PASCAL is FAST - up to 20 times the speed of BASIC

WHAT IS OXFORD PASCAL?

OXFORD PASCAL is a COMPLETE implementation of the popular programming language PASCAL running on the Commodore 64.

GRAPHICS & SOUND

With the OXFORD extensions to PASCAL you can programme dazzling graphics and astounding sound.

YOUR FUTURE WITH COMPUTERS DEPENDS ON PASCAL

WHAT YOU GET

With the cassette version of OXFORD PASCAL you get:

- A powerful text editor for preparing PASCAL programs
- A resident compiler giving 14k of user RAM
- A powerful set of colour graphics and sound extensions to standard PASCAL

With the disk version of OXFORD PASCAL you get:

- All the above, PLUS
- A full disk to disk compiler exploiting the entire memory of the 64 for PASCAL programs.

HOW MUCH DOES OXFORD PASCAL COST?

Cassette version (resident compiler only) £14.95
Full disk compiler (1541, 4040, 8050, 8250 drives) £49.95
Prices are exclusive of VAT. There is also a small charge for post and packing.

CLASSIFIED

Vic-20 plus cassette + 16K
Remocon, security copy tape for (Scramble + 7 others, misc games, user Reference manual Quickstart joystick Sargol II Chess Jupiter Landing + two adventure cartridges Nine months old \$125 Write S Connelly, 3824 North Road, Leicester LE2 2PN.

Big Vic-20 nearest \$300 success package 16K Prog Aid, Super top Sargol Stack Victor 4 Victor 3 Custom built switchable motherboard, Intro to Basic and Sargol Four books and more Games available on tape RE Warren, 5 Arthing Drive Hale Arthingham Tel 061 904 0450

For sale CBM64 1625 printer C2N cassette unit joystick, printer paper labels magazines, computing book and software worth over £100. Must go all together. Offers for the whole lot to Mr A Saggard 88 High Street Southall Middlesex UB1 3DB. Buyer must collect or arrange delivery.

Latest Vic-20 plus manuals, 16k expansion Super Expander Programmer's Aid 7 cartridge games, Intro to Basic \$200 of software. Programmer's Reference Guide, many books, maps and letters. All in superb condition. Will send directly to you. Worth \$500. Bargain of \$200. are Contact Lee Pearce 46 Westward Road Highgate Bristol.

Discount software for the Commodore Vic-20 (and Apple II) Vic-20 Software Shopman (\$5.75) Crazy Kong (\$5.75) VIC (5.75) (\$4.75) Maelstrom (\$3.35) Terminator (\$6.25) Anak (\$5.75) Cricchet (\$5.75) Escape (\$5.75), Bomber (\$5.75) Rescue from Nufon (\$5.75) Comic Brewster (\$6.25) Dog Race (\$4.95) Fuel Pedals (\$5.75) Iomega (\$5.75) Skunk (\$3.95) Superdemon (\$5.75) Orkello (\$5.75) Surfin Sam (\$5.50), Draw (\$4.35), Spell Master (\$5.20), Memory (\$4.70) Plow by Tumbers (\$4.75) Jumble (\$4.75), Coward Change (\$4.35) Ultimate Iron Ore (\$4.50) and much more. Disk add \$1.50. Specify Vic-20 to order. Write Discount Software PO Box 1489 Niagara-on-the-Lake, Ontario, Canada L3S 1J0.

Vic-20 (210 C2N recorder printer and plotter many cassettes and cartridges, Top 2 joystick, dust cover, book. Still new guarantee. Bargain at \$710. are Contact 37 Chilton Park Drive, Clitheroe Lancs or Tel 007 23276.

Speech synthesis for the Commodore 64 Unlimited vocabulary Price \$25.00 including plus. Cassette based demonstration program and full instructions. Send sc to PO Box 28, Portsmouth PO4 9SH.

Vic-20 software all good makes Melbourne House Rabbit Anrog, Llamasoft, Pixel, Mr Micro Includes Laserzone Gridrunner Andes Attack Trader Mysterion Island 16K Kong. Guaranteed good price grand condition. Phone (0302) 536462 after 5pm, weekends, anytime.

Commodore 64 owners

Midland Computer Library

All games originals over 250 titles, cassette disk ROM, 25 new titles per month discounts off new software special offer for new members. A free game offer, first two games sent free. Send large size for details.

Middle, 31 Eversledge Close, Lodge Park, Redditch B98 7NA. Tel (0527) 26051

Sums for fun, Early primary school arithmetic help for your children. On cassette for unexpanded Vic-20. Only \$2.00 inc p&p. Cheques, PO to G Foster Box 010.

28K Vic-20 plus machine code monitor 40/80 column card 4 slot motherboard C2N joystick Over \$100 of software (cassette and cassette) and books. A bargain at \$225.00. Phone Norwich (0403) 357335 after 4pm or write to A van Wieringen, 51 Pound Lane, Thorpe St Andrew Norwich NR7 0UN.

Rem if you have got a second hand Commodore 64 or 800. At 8 you can't wait then drop me a line because I might buy it. Tel 0462 811699. Ask for Steven.

Header reader reveals hidden secrets of tape headers. Datalog menu driven utility for transferring or reading sequential files to/from tape/disk. Both programs have printer output. C64/Vic-20 (Exp)/Vic-20 (Unexp) version available \$6.50 each/\$10 both. Specify version G Samphir, 8 Wilfoway Gardens, Gillingham Kent ME8 8TS.

Personal back up copies for CBM64. Will copy most cassettes to expanded software from cassette to cassette or cassette to disk with instructions. Send \$3.50 to 54 Livingstone Road Walthamstow London E17.

Toddler's Play with your parents CBM64 Animated musical flashcard and spelling program developed in collaboration with school and educational psychologists. Suitable 1½ - 7yrs Cassette \$4.50. Disk \$7 from Toddler's 1 Col Lane Cloughton, Ewloe, Orson OX9 6HX.

14 year old wants penpal who owns a 64. Exchange programs and ideas. Write to Steven Oliver, 20 Chacombe Road, Middleton Cheney nr Banbury Oxon.

For sale Commodore 64 and 1525 printer, cassette unit joystick, \$50 software inc. Wordpro Database Matrix, Jammer's etc. Based, new \$400 Oxford S13205.

Echo superb Basic and M/C tape copier. Written in M/C and copies most commercial software. Supplied on a quality cassette containing full instructions for CBM64. Send \$6.50 to Echo, 5 The Breeds, Victoria Way, Chorlton SE7. This is a professional program.

For sale Commodore 64 complete with cassette recorder, joystick, games, Intro to Basic, books \$300 spent bargain at \$210. 4 months old. Tel 061 483 0344. A Coxon, 162 Tachside Close, Offerton, Stockport Cheshire SK2 8NN.

Commodore 64 Utilities, Two superb utilities to assist all CBM64 owners. Utility 1 Back up Utility. This will allow the user to make personal back up copies of most cassette software available onto tape or disk. Utility 2 Tape to Disk Utility. Will help transfer your cassette software onto disk. Both supplied on data cassette with full written instructions, priced at just \$4.99 each or send sc for full details to Clark Kent Software, 26 Northcote Walk, Corby Northamptonshire NN18 9QJ.

Sophisticated character generator written in M/C for the unexpanded Vic-20. Includes vert and horiz reflection reverse select, transfer, data statements, binary save load. Instructions included. \$4.75 inc p&p. Brian Thompson, 19 Redrope Road, Gorton, Manchester M18 8RD.

MUSIC PROGRAMS

More distributors and retailers of selected music & software. Write to: MUSIC SALES LIMITED, 11 Northampton Road, Luton, Bedfordshire LU1 1JH. Tel 0525 555555.

MUSIC SALES LIMITED

11 Northampton Road, Luton, Bedfordshire LU1 1JH.

Wanted pen pal to exchange info about Vic 20. I am 35, male, have disk, tape, printer. Terry Zimmermann, 749 Huntington Parkway, Nashville, TN 37211 USA.

Exchange your unwanted Commodore 64 software via Humphrey Software. Only 75p per swap. Send sc for details to 49 Unclerode Road, Shrewsbury Shropshire SY2 6DT.

US 64 user wishes to trade software with UK user. Products of both countries are very different. Sybex desired. Write Andrew Bush, 308 West 4th Street NY NY 10014, USA.

Home accounts. Put your home in order. Probably home computing's best use. Comprehensive coverage of bank accounts, credit cards, H.P. Inbuilt accuracy check. Records all transactions. Projects cashflow for any period ahead. Available for CBM64 or Vic-20. £12 or FREE details from R.B. Computer Services, 2 Hazlewood, Windmill Hill, Brighthelm, Devon Tel 080 4555532.

Home accounts. Put your home in order. Probably home computing's best use. Comprehensive coverage of bank accounts, credit cards, H.P. Inbuilt accuracy check. Records all transactions. Projects cashflow for any period ahead. Available for CBM64 or Vic-20. £12 or FREE details from R.B. Computer Services, 2 Hazlewood, Windmill Hill, Brighthelm, Devon Tel 080 4555532.

Commodore 64 software, All in original packaging. On disk. Fast Script (\$40), Easy Check (\$45), Future Frontiers (\$45), Superhero (\$40), P.A.L. Assembler (\$40), Music Construction Set (\$20), On cassette: Synth4 (\$6), Interceptor Assembler \$6 (\$3), Robot Graphics Editor (\$3), Gridrunner (\$4), Matrix (\$4), Attack of Mutant Comets (\$4), Hover Bopper (\$4), Motor Maniac (\$4), Escape M.C.P. (\$3). On cartridge: Simon's Game (\$30). Alternatively will sell the lot for \$275 (total retail value over \$500). Telephone Fleewood (03917) 21179 and keep trying!

Compute a Frog. Want French papers (age 11-15) interested in Commodore computing to exchange programs etc? Contact: The French Connection Section 'Patamafique', Collège Pierre Dubois 71 Rue Victor Rossat, 53017 Laval, France

Wanted, a penpal to swap ideas with. I'm only an intermediate programmer. Please answer this advertisement and write to: Antonio Cataldo, 2 Yeovil Court, Mulgrave, Victoria, Australia, 3170

Vic-20 + tape deck + 16K RAM + four slot motherboard + speech synthesiser + intro to Basic Part 1 and 2 + lots of software + Programmer's Reference Guide + game cartridge + other bits cost £315 sell for £200 one Phone Southend 545807

Commodore 64 with Maxim recorder and interface, Quick Start joystick and three games Lazorion, Arcadia and The Golden Baton £220 inc p&p. You can save over £50 on this unit. Phone Newland 601021

International software exchange club desires to exchange quality C64 software. Actually we have about 400 programs. Send your list to ISE, (Ref A), PO Box 21 57100 Livorno, Italy

C64 64K and disk drive 1541 both together £250 Tel: Cardiff (0222) 36197 Might sell separately

Sporting Forecasts programs by Professor Frank George for Commodore 64 Horse Race Forecast, Football Forecast and Poolroom now available. Details from Parkingrove, PO Box 161, Brundall, Norwich.

Vic-20 for sale with software includes eleven popular cartridge games and three free cassettes. Cartridges would cost £110 if bought separately but with Vic £85. Must be sold together. Phone 021 705 6340 anytime or write: I. Crowley, 13 Marsham Court Road, Southill, West Midlands B91 2ET

Single disk back-up for Commodore 64. Completely full disk copied in twenty minutes. Three insertions per disk. For details send sale to 37 Coombe Avenue, Bournemouth, Dorset

Commodore 1520 printer picture as new \$80 Tel (0932) 241242

Vic-20 tape backup copier copies 95% of programs currently on sale, only \$3.00 + 50p P&P. Send money to: Mr N Mills, 70 Mill Beck Lane, Cottingham, N. Humberside

Vic-20 plus 16K Rampack, also C2M cassette deck, books, magazines and software. All offers to P. Rowen, 24 Glenhome Avenue, Belfast BT8 4LU

Wordcraft Word Processor for Vic-20 cartridges also contains 8K usable RAM only \$50. Phone Wakefield 262571.

Stack storeboard with 8K RAM fitted, Super Expander cartridge and Sargon II chess cartridge. 9248 Phone (0924) 473037 after 6pm

40 column screen converter for the Vic, on cassette by AudioLogic £6. Centronics Interface and cable for Vic, enabling use of parallel printer \$15. Phone after 7pm Stoke-on-Trent (0782) 641029

IC Basic cartridge \$40 one. Unwanted present. Ring Blackpool 62277 Barry, 40 Burnside Avenue, Blackpool FY4 4AF

Vic software sale: Gridrunner \$3.25, Star Defence \$4.75, Markon Raider \$3.50, Quest of Merchid \$4.75, Star Warp II \$3.25, Froggie \$3.50, Originals Mr M Taylor, 16 Gleason Drive, Ovington, Kent

Vic-20 software (will separate) Super Expander, Home Office, Skrambles, Chess, Jetpac, Hellgate, Myriad Nightcrawler, Hoopl! Price negotiable Tel (026363) 3062

Vic-20 4 slot motherboard + 16K Rampack + Super Expander + Program Aid + Light Pen. \$100 one. Alan 01-390 5043.

Wanted penpal for Vic-20 user. Swap tips etc. Age 16, name: Karen Jane Duffy, 4 Lane End Road, Burnage, Manchester 19 1WA.

Simons Basic for C64 114 new commands in cartridge. Phone for details on Gullcroft (0483) 233201 any time, only £29.

Vic-20 software to sell (\$4 per tape) or swap 20 great files. See for list to 5 Willis, 12 Lonsdowne Road, Chatham, Kent

Natural health centre urgently requires programs relative to natural therapies (eg. biorythms, astrology, homeopathy, herbalism, aromatherapy, etc). Please telephone Geoffrey Keyte at 0908 463591

Wanted urgently. Commodore 1520 printer/platter manual to buy or copy. Willing to pay Tel Padgate 818189 after 6pm. Please ask for Joe

Commodore 64 penpal out there? age 14-16, with a view on swapping ideas and knowledge etc. Name D. Rossiter. Address: Barn Cottage, Middle Baggdon Lane, Paignton, Devon TQ3 3YE

Vic software for sale due to purchase of 64. Various games \$2 to \$6. Also Programmer's Aid Cartridge \$15. Phone Guildford 39966

Programs for C64 on disk. send me your prog lists. I'll send mine in return (have over 500 prgs) Øyvind Amlien, Finstadtrabben 97, N-1475 Finstadtrabben, Norway

Wanted: English software suppliers willing to ship 64 software to America. Send int/ catalogue to Samuel Lubell, 56 Meadow Road, Braintree Manor, New York 10510, USA.

Toddler's play with your parents' C64! Animated, musical flashcard and spelling program, developed in conjunction with school. Suitable 1½ - 7 years. Cassette £4.50, disk £7.00 from Toddler's, 1 Cat Lane College, Ewellme, Oxon OX9 6HX.

Wanted: Jelly Monsters cartridge. Will swap for Averaging cartridge and chess cartridge or two tape software cassettes. Contact Ibrahim on 01-241 0370 London, Hackney

Trade C64 64 programs Write: Ric Kube, McCulloch Street, Waverley, SA 5330, Australia. Please send list

Arrowhead cartridge for Commodore 64, very fast save and load of all tape programs plus other functions. Two months old, only \$36. Medford, 2 Thorn Grove, Hale, Altringham, Cheshire WA15 9AW

Swap Imagine's Bewitched cassette (for Vic 20) for any other Imagine cassette. Tel 0570 470362 after 6pm

I have a very original idea for a computer game, but I haven't the skill or time to write it. Any offers? N Tregonzo, 1 Gully Hill, Reibubus, Penzance, Cornwall

Wanted someone who wishes to swap programs for the Vic 20 or to buy games. Many files including arcade. Paul Woolson, 6 Kirkmeadow, Bletton, Peterborough, Tel 269736

Swap complete set of golf club, bag, trolley, umbrella etc for Commodore printer or compatible printer for C64. Ring Letchworth 6854. Beardsley 11 Jordan, Letchworth, Herts SG6 2NP

Commodore 64 plus C2M cassette. Introduction to Basic and Spellerman £190. Abingdon 31871

Wanted Commodore 64 disk drive and printer in good working order. Can collect locally. M Wotton 70 Maple Crescent Newbury Berks

Vic-20 Reference Bank, Programmer's References Guide. Brix, Flight 0 1-5 games. Some Vic magazines \$75. Tel Rustington 75689. Keeble 10 The Framptons, East Preston West Sussex

Trader for Vic + 16K Original in good condition. Booklet included. Sell for £10 or consider exchange for cartridge (please specify). Phone 0504 39779 after 6pm

Vic-20 software for sale. Cassettes \$3, cartridges \$5. Many top titles. 16K memory \$10. Send size for list. Martin Webb 30 Helena Street, Mexborough South Yorks S64 9FF

C64 64 software Spellerman, Maths (SGC) and Music Composer \$5 each or swap. 01 998 3712, ask for Barry

If your age is greater than ten but less than 14 and you have a Vic-20 micro (late), if you are bored with your Vic games and want to penpal to exchange software with contact J Watson, 6 Redwood Glen, Chapelton, Sheffield S30 4EA or phone 0742 (if outside Sheffield) 463565 after 4pm

C64 64 copier and reader. Will backup large proportion of cassette based software onto tape and disk. Available on disk \$8 or tape \$6. Cheques/PO to: Simon Harris, Box 011

Any Commodore 64 users overseas who want to swap information and software I have games and magazines from America. Send to: Ray Lew, 126 Mitford Street, Elwood 3184, Victoria, Australia.

Future Finance business
software on disk. Unwanted
unused gift £34 including
damage. Phone Lancaster
67579

Vic-20 + cassette + over £130
software books games
discovers All for £160 ono Bill
2 Winchester Road
Isleworth Kent O1 304 4741

64 utilities and games to swap
ask or tape. Many titles. Tel 0522
27783 evenings or weekends. A
Stafford 144 Catholme Road
Lincoln LN1 1SL

Commodore 3032, dual disks
Wordcraft Simplicale games
books, lookit printer interface
 bargain £475. Also selling
programs for C8M 64 Easycript
High Flyer Tel David, Hornchurch
040 24 55733

Vic-20 plus 6K RAM pack, 7 arcade cartridge games, book of games Part 1 Basic course
No cassette deck. £120 the lot
(White & Station Cottages, Hitchin
Herts SG4 9UN)

Yic-20 software for sale
Defender Panic Bewitched Mini
King, Wizard and Princess. All
originals from Bubble Bus, Bug
Byte, Imagine Anrog, Melbourne
House. Sale to 73 North Road
Augschaw, Manchester M34
6D1.

IBM 64 copier plus header reader program. Make backup copies of your favourite software. On tape only. Instructions in program. £5. R Stone, 64 Cymannerh Road, Gwamman, Ammanford, Dyfed, G. Wales.

Sales and swaps for unexpended Vic. Cassettes and cartridges including Avenger Tomado, Arcadia. All offers considered. Phone Rupert on 021 454 0234, Monday to Friday 4.30pm to 7pm.

Vic-20 games: Arcadia, Scramble, Space Rescue, Catcha Snatcha, Gold Rush, Wizard and Princess. All for expanded Vic and cost only £4 each. All originals D5. Nash 43 Hempcroft Road, Timperley, Altrincham, Cheshire WA15 7JG Tel 061 980 5232.

IBM 3020 model 32K memory
Went £240 Only 2 years old,
hardly ever used Phone 01 959
2185 (buyer collects)

64 software club: all Commodore 64 users who are interested in obtaining quality public domain software should join Club 64. 85 Upper Drumcondra Road, Dublin 9, Ireland.

15 year old boy wanting girlfriend. Would prefer any girl who knows any amount of programming on the Vic-20
Gary J Nattrass, 9 Leventhorpe Avenue, Bradford 8, West Yorks

Penpel for inexperienced
 sixteen year old. Can come from
 anywhere in the country. My
 address is Alison Muir 22 Glen
 Ogilvie St Leonards East Kilbride
 Glasgow, Scotland G74 3SY

Romik Multisound Synthesiser
for unexp Vic 20 Price - only
£450 Telephone Broughton,
812619 and ask for Colin

Vic-20, Vixen 14K, Buft Plus
Sargon II Chess, Jelly Monsters,
Motherboard Reference Guide
Dr Watson and dozens of
cassette games. All boxed £160
Colin Lennax, 16 Hutton Street
Sunderland SR4 7HS Tel: 0783
79098

Needed 1 Vic-20 or Commodore 64 for a company to be used as a normal computer and a home computer. If you have one for sale ring Fleet 22870 (Hampshire).

Intro to Basic | \$10 one barrel
used The Counil Adventure \$5
Allen Blitz \$6 or set \$18 Contact
Jackie McIntyre 1 Lever Park
Portlewart Co Londonderry N
Ireland (Mc 20)

Help needed desperately. Lady leaving her hair out needs help to solve adventure game, Tomb of Xerxes. Greta Halliday 14 Hazelhurst Drive Cheddleton nr Leek, Staffordshire. 0538 361160

14 year old boy would like
penpal to swap tips for Vic-20 +
Super Expander Write to
Dominic Ramsey 2 The Paddock
Haddenham, Bucks HP17 8AG

Vic-20 Super Expander £20
Also Sargon Chess £8 or both for
£26 Brian Thompson 19
Redacre Road, Abbey Hey
Gorton, Manchester M16 8RD

Datassette unit model C2N
unused boxed Surplus to
requirements \$25 Phone SI
Albans 54119 evenings

Wanted 1515 printer manual
Need help Vic 20 Basic
programming? If you're stuck
maybe I can help. Hints and
ideas exchanged. Contact Terry
Rushent, 14 Weston Avenue
Leichdon, NSW. Beds L07 8G2.

Commodore 64 listings: send your tape or disk with large sale and £1.20 for fast return to J Ratsey-Woodroffe The Retreat Yarmouth I.O.W. PO41 0XW Large amount of software to swap!

Unwanted Commodore games
given as a birthday present,
want to sell *Krazy Kong*, *Arcadia*,
Scramble 64, and *Annihilator*. All
new, want \$20. Originally sold for
\$25. Please write to: Hitesh Shah,
53 Tottenham Road, Palmers
Green, London N13 6HY. Will
consider selling separately.

CBM64 disk drive and printer
dust cover disk box 20 disks
paper 5 games + cassette
interface + BC Basic Advanced
Programmer's Guide £450
Phone 01 515 6202 after 7pm
Peter Shores

My complete computer system for sale includes Commodore 64 cassette unit 1541 disk drive 1520 printer plotter desk joystick games manuals magazines Hoggle around \$425 Please ring Ianley (02356) 4579

Wanted to form or join CBM64 users club: Castle Point, Essex. Phone Ian on Convey Island 682719

Vic-20 for sale: Avenger \$4
Arcadia \$3.50 Andes Attack
\$3.50 Wanted Audiogenic's
Faith Compute's First Book of Vic
Epyx's Crush Crumble and
Chomp and Atari's Defender
Phone now! 0558 822509

Vic speech synthesiser for sale
Cost \$49.95 Will sell for \$20 and
Wanted vgc Datasette recorder
Will buy or swap for speech
synthesiser Phone Richard on
Wetwin Garden City 28587

CEM44 International Software Exchange Send your software list to German user group.
Buchtenweg 3a, 6909 Walldorf,
6909

Vic-20 16K, Super Expander
Intro to Basic I \$100 software
will consider splitting Telephone
Atherstone 3017

Vic-20 cartridges.
Programmer's Aid speech synthesizer built from Maplin Talk Back - working! £20 each or both for £35. Phone 021 3536383.

Vic-20 games for sale
Munchman £4.50 Metagolactic
Llamas £5 will swap for other
games Gary Turner 19 The
Parks Sundome Grove
Shrewsbury SY1 4EU Tel: (0743)
61967

Vic-20 for sale, boxed, with C2N cassette recorder, 3K RAM pack, Programmer's Reference Guide and a selection of games. £75 for quick sale. Tel: (0734) 785690 after 5pm.

Arton seven slot expansion unit for Vic (switched) plus 8K Super Expander Prog Aid £100. Will separate 35 Alder Close, Helton Le Holme, Lyme & Wear. Tel 0783 262140.

Vic-20 user wants teenage
penpals for exchange of
game ideas etc. Preferably
from southern England. Contact
Tiz (nr) 6 Woodside Close
Northorpe, nr Bourne, Lincs PE10
(HW) (Age 13)

Wie-20 + 32K RAMpack + Golf
carriage and three other games
with \$180 Sell for \$140 Address
Hawthorn Pains Hill Wern
Salon Tel (0909) 32810.

Irish Vic owner interested in contacting other landlords to swap games, tips etc through post. Write to: Fergal McGirl, 27 Sycamore Road, Finglas, Dublin 11.

Disabled 64 beginner would like to join computer club Stoke on Trent area. Fred Bates, 27 Chilton Street, Heron Cross, Fenton, Stoke on Trent, Staffs. Tel: 0782 323524.

Wacky Waiters for the
unexpanded vic 20 for sale £5.
Also Metagalactic Llamas, Battle
at the Edge of Time £5.
Telephone: Brownhills 375836

Vic-20 complete starter pack and two cartridge games, books and several cassette games to the value of £50. Perfect condition. £120 ono. Telephone 0942 812480.

Vic-20 C2N cassette 1540 disk
1525 printer Programmer's Aid
Super Expander 16K RAM
software on disk and tape +
mags As new 5400 and let
Stevenage 350308

MASTER MINDS.



PASS ALL THE QUESTIONS AND DISCOVER THE ANSWER...

■ If you can write original programs, convert from one machine to another and expect your rewards to equal your effort then you may be the person we are looking for.

■ We require programmers proficient in machine code on the Z80 series, 68000 series, 6809, and 6502/6510 processors. We require games, utilities and education programs on the Commodore 64, Spectrum, QL, Electron, BBC, Atari, Memotech, Dragon, Almos and MSX computers.

■ In return we are offering the right person the opportunity to have their program released throughout Europe by Quicksilver Ltd and throughout the Americas by Quicksilver Inc., plus the financial security that only we can offer and

the opportunity to join the greatest team in the Universe!

■ If you want to be associated with the top software house then phone Paul on the hotline today, it may be the start of a great future!

Software Houses

■ Let us take away your problems and give you the opportunity to get back to programming.

■ Quicksilver can provide the financial security, production, promotion, marketing and distribution for all your needs.

■ For a frank discussion, in the strictest confidence, phone Rod Cousens today on (0703) 26515.

QUICKSILVER

We have all the answers.

Quicksilver Limited

Palmerston Park House, 13 Palmerston Road, Southampton Hampshire SO1 1LL

Telephone (0703) 26515 Telex 477889 QSILVA

A new age has dawned
with the

STACK LIGHTPEN

It's a new, easier way to create software and it's fun too! The Stack Light Pen means freedom from the old labours of the keyboard and a new software style for the future.

Using the Light Pen means you can create programs including games with that extra dimension control at the touch of the pen. With your Light Pen you can remove words or images from the screen or put them back onto it, or simply move them about the screen. You can even trigger off a series of actions on screen, stopping them at will with the touch of the Light Pen.

Already
Available
For

BBC

ATARI

VIC-20

COMMODORE 64

And it's so easy to use simply hold it against the screen, touch the contacts and away you go!

LIGHTPEN SOFTWARE

We've already created software for you to use with your Stack Light Pen...

DRAUGHTS GO LIFE CROSSWORD TWISTER SIMON OTHELLO SEEK & DESTROY SHUFFLER LOST IN THE LABYRINTH and there's more on the way!

STACK LIGHT PENS and SOFTWARE are available from your LOCAL DEALER or direct from:

STACK COMPUTER SERVICES LTD, 290-298 Derby Road, Bootle, Merseyside L20 8LN
(24 HRS) Telephone 051-933 5511, Telex 627026 (Stack G).

Please supply LIGHTPENS for the

BBC ☐ **Atari** ☐ **VIC-20** ☐ **Commodore 64** ☐

and the following Software titles

at £25.00 each £

at £5.00 each £

Add VAT at 15% £

TOTAL £

I enclose a cheque PO for £

Please charge £ to my credit card (specify card)

Card No Name

Address



As also
Borley and Vase
American Express
Direct